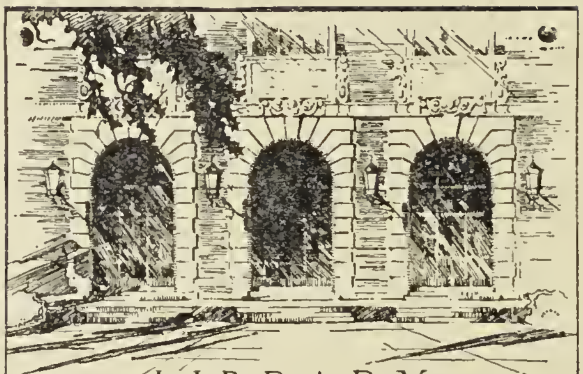

THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXVI January 15, 1942 Number 1

IN THIS ISSUE

THE WEATHER AND DISEASE SITUATION IN MASSACHUSETTS FOR 1941

O. C. Boyd

Weather Conditions Unusual

Contrasted with the abnormally cold, wet, late spring of last year, the 1941 growing season opened unusually early, warm and dry. Both March and April were far below normal in rainfall (Table 1), and the mean daily temperature for April was 5.3° F above normal. Of the 36 stations that reported daily temperatures for April to the Boston Office of the U. S. Weather Bureau, 11 reported "highest temperature" of 90° F, or higher, the highest one being 93°. It was one of the warmest, driest Aprils on record. Frost in the ground was shallow in most places and came out early. Fruit trees came into blossom from 10 to 14 days earlier than normal.

Table 1. - Rainfall and Temperature Records for March to October in Massachusetts, 1941.

Month	Precipitation (Inches)		Daily Temperature (°F)	
	Mean	Departure from Normal	Mean	Departure from Normal
March	2.37	-1.55	31.0	-3.9
April	1.37	-2.21	50.5	+5.3
May	2.69	-0.59	58.1	+1.6
June	3.98	+0.48	66.4	+1.3
July	4.30	+0.80	70.6	+0.3
August	3.03	-0.67	67.9	-0.6
September	1.11	-2.75	63.5	+1.5
October	2.28	-1.21	53.1	+1.6
Total	21.13	-7.70	-	+7.1

May, although with only about 0.6 inch deficit in rainfall (Table 1), was in effect a warm, dry month, following the tremendous shortage of rain during the March-April period. In fact, all but 11 of the 62 weather stations reported deficits in rainfall for that month. In Table 2, where the precipitation records are grouped according to counties, it is seen that only in Essex County was the rainfall above normal for that month. In the others, the deficits ranged from 7.5 percent to 45.5 percent of normal for those areas. The mean temperature for the State during May was 1.6° F above normal.

The weather during June was peculiar. The mean daily temperature for the 36 reporting stations was 1.6°F above normal for that month. In some sections of the State, the latter part of the month was unusually hot. For example, in Amherst, with the exception of 3 days, the maximum daily temperatures for the period of June 19 to July 2 ranged from 88° to 94°F, with 8 of the days being above 90°. Another unusual feature was the high, continuous wind that lasted from June 8 to 11. It caused severe

damage to newly set tobacco fields and to cucumbers and other tender plants in gardens and fields. Such wind and dust storms usually occur during April or the early part of May.

The rainfall for June was unevenly distributed over the State. In those areas where the spring drought extended through June, the shortage of soil moisture was keenly felt by most garden and field crops. As seen in Table 2, Berkshire County was only slightly below normal in precipitation, but Essex County's rainfall was scarcely 60 percent of normal, while rainfall was above normal for all other county-areas. In fact, Barnstable and Bristol Counties received increases of over 95 percent and 62 percent respectively, above their normals.

July likewise was slightly above normal in both rainfall and mean temperature for the State as a whole (Table 1). Only one county, Middlesex, experienced a deficit for that month (Table 2). Seven of its 8 stations reported deficits, the total shortage for the 8 stations being 29 percent of the normal precipitation. Hampden County received the greatest increase in rainfall above its normal, namely, 47.2 percent.

August rated about as far below as July was above normal in rainfall (Table 1). Each station in Bristol, Essex, Franklin, Middlesex, and Plymouth Counties recorded a deficit for the month. Three of the stations in Hampshire County reported excesses, but the deficit for the fourth station (Amherst) was great enough to more than offset the increases in the other three. Essex and Franklin Counties experienced the greatest deficits in rainfall, namely, 47.1 percent and 43.3 percent respectively (Table 2).

Both September and October were deficient in rainfall for the State as a whole, and their mean temperatures were above normal (Table 1).

All in all, it was an early, warm, dry season. The mean temperature for each month from April to October, except August, was above normal (Table 1), and during the same period the rainfall was below normal for each month except June and July when it was only very slightly above normal. The mean deficit for the State in precipitation for the period of March to October was 7.7 inches, while the departure from the normal mean temperature for the same period was +7.1°F.

Table 2. - Rainfall by Counties for April to August, 1941.

Counties and Months (+)	Stations Reporting (*)	Rainfall (Inches)	Departure from Normal: Inches	Departure from Normal: Percent
Barnstable				
April	3	10.23	- 0.83	- 7.5
May	3	5.59	- 4.66	-45.5
June	3	19.11	+ 9.34	+95.6
July	3	11.27	+ 1.68	+17.5
August	3	13.32	+ 2.88	+27.6
Total	-	59.52	+ 8.41	+16.4

Table 2. (continued) - Rainfall by Counties for April to August, 1941

Counties and Months (+)	Stations Reporting (*)	Rainfall (Inches)	Departure from Normal	
			Inches	Percent
Berkshire				
April	8	5.68	-20.67	-78.4
May	7	20.36	- 4.08	-16.6
June	6	23.58	- 0.26	- 1.0
July	8	42.11	+ 7.10	+20.2
August	5	18.29	- 3.58	-16.3
Total	-	110.02	-21.49	-16.4
Bristol				
April	4	7.99	- 8.10	-50.6
May	4	8.24	- 5.28	-39.0
June	4	20.78	+ 7.97	+62.2
July	4	18.61	+ 4.17	+28.8
August	4	11.44	- 4.65	-28.8
Total	-	67.06	- 5.69	- 7.8
Essex				
April	5	7.37	-12.32	-62.5
May	6	18.55	+ 0.49	+ 2.9
June	6	12.48	- 3.71	-41.1
July	5	19.10	+ 2.44	+14.6
August	6	10.95	- 9.76	-47.1
Total	-	68.45	-27.86	-28.9
Franklin				
April	4	3.49	-10.59	-75.2
May	4	8.95	- 5.00	-33.4
June	3	12.89	+ 2.66	+26.0
July	4	17.07	+ 2.55	+17.5
August	4	8.65	- 6.62	-43.3
Total	-	51.05	-17.00	-24.9
Hampden				
April	4	3.10	-11.64	-79.0
May	4	11.15	- 3.10	-21.7
June	3	13.53	+ 2.72	+25.1
July	4	22.59	+ 7.25	+47.2
August	4	12.95	- 3.98	-23.5
Total	-	63.32	- 8.75	-12.1
Hampshire				
April	4	2.87	-11.45	-80.0
May	5	17.90	- 1.46	- 7.5
June	4	20.03	+ 3.59	+21.8
July	4	21.91	+ 4.91	+28.8
August	4	15.96	- 0.75	- 4.5
Total	-	79.67	- 5.16	- 6.0

Table 2. (continued) - Rainfall by Counties for April to August, 1941

Counties and Months (+)	Stations Reporting (*)	Rainfall (Inches)	Departure from Normal Inches	Departure from Normal Percent
Middlesex				
April	8	9.85	-20.97	-68.0
May	8	18.84	- 6.19	-24.7
June	8	25.64	- 2.89	-10.1
July	8	24.18	- 4.04	-14.3
August	8	22.20	- 7.24	-24.5
Total	-	100.71	-41.33	-29.0
Plymouth				
April	5	12.85	- 6.72	-34.3
May	5	15.16	- 0.04	- 2.5
June	5	24.57	+ 8.06	+48.8
July	5	20.83	+ 2.61	+14.3
August	5	12.53	- 6.17	-33.0
Total	-	85.94	- 2.26	- 2.5
Worcester				
April	16	15.77	-43.55	-72.9
May	16	44.14	- 6.96	-13.6
June	15	48.34	- 3.92	- 9.2
July	17	72.21	+ 6.09	+ 9.1
August	16	52.64	-11.86	-18.3
Total	--	233.10	-60.20	-20.5

(+) Only those counties with 3 or more stations reporting.
(*) Reporting stations:

Barnstable Co.: - Hatchville, Hyannis, Provincetown.
Berkshire Co.: - Peru, Pittsfield, So. Egremont, Stockbridge, West Otis, Williamstown.
Bristol Co.: - Fall River, Mansfield, New Bedford, Taunton.
Essex Co.: - Gloucester, Haverhill, Ipswich, Lawrence, Swampscott, Rockport.
Franklin Co.: - Heath, Montague City, Shelburne Falls, Turners Falls.
Hampden Co.: - Chester, Holyoke, Springfield, Westfield.
Hampshire Co.: - Amherst, Chesterfield, Plainfield, Ware, West Cummington.
Middlesex Co.: - Ashland, Concord, Framingham, Groton, Lowell, Lake Cochituate, Spot Pond, Weston.
Plymouth Co.: - Brockton, E. Wareham, Middleboro, Pembroke, Plymouth.
Worcester Co.: - Boylston, Clinton, Fitchburg, Gardner, Hardwick, Hubbardston, Jefferson, Milford, Northbridge, Petersham, Princeton, Southbridge, Sterling, Webster, West Rutland, Winchendon, Worcester.

The Disease Situation

Owing to the dry season, most plant diseases caused by fungi, bacteria, and slime molds were scarce and light, particularly those that ordinarily start during April and May, or in some sections of the State, this year, even during June. Notable among them were Botrytis blights of tulip and peony [Botrytis tulipae, B. paeoniae] anthracnose of sycamore and white oak [Gnomonia veneta] Gnomonia leaf spot of elm [G. ulmea], leaf blotch of horsechestnut [Guignardia aesculi], leaf spots of maples, bacterial blight [Phytomonas syringae], and anthracnose* [G. aridum] and rust [Puccinia peridermiospora] of ash; also the black spot diseases of delphinium [Phytomonas delphinii] and of rose [Diplocarpon rosae].

The general rainy period during May 8-10 constituted the first general infection period of the season for plant parts above ground. It occurred around mid-bloom for apple orchards.

Fruit diseases ordinarily of considerable importance, that were unusually scarce and easily controlled include scab, frog-eye leaf spot and cedar-apple rust of apple [Venturia inaequalis, Physalospora obtusa, Gymnosporangium juniperi-virginianae]; scab and curl of peach and brown rot of stone fruits [Cladosporium carpophilum, Taphrina deformans, Sclerotinia fructicola], Botrytis fruit rot of strawberries and spur blight and anthracnose of raspberries [Botrytis cinerea, Didymella applanata, Elsinoë veneta]

Vegetable diseases that were either absent or of slight importance in most sections were early blight, late blight, and Septoria leaf spot of tomato [Alternaria solani, Phytophthora infestans, Septoria lycopersici]; early and late blights of celery [Cercospora apii, Septoria spp.]; downy mildews of lettuce, cucurbits, spinach and onion [Bremia lactucae, Pseudoperonospora cubensis, Peronospora effusa, P. destructor]; early blight of potatoes [Alternaria solani], and Macrosporium leaf blight, scab, and anthracnose of muskmelons [Alternaria cucumerina, Cladosporium cucumerinum, Colletotrichum lagenarium]. Tobacco wildfire and angular leaf spot [Phytomonas tabaci, P. angulata] likewise were less prevalent this year than usual.

Diseases That Were About Normal: These included Rhizoctonia sprout rot, scab, black leg, and virus diseases of potato, and even potato late blight in Bristol County and in the three Connecticut River Valley counties [R. solani, Actinomyces scabies, Erwinia phytophthora, Phytophthora infestans]; bacterial leaf spot of peach and plums and quince rust on apple in Bristol and Barnstable Counties [Phytomonas pruni, Gymnosporangium clavipes]; common leaf spot and spring dwarf of strawberries on Cape Cod [Mycosphaerella fragariae, Aphelenchoides fragariae]; scab [C. cucumerinum] of cucumbers in Western Massachusetts; and bacterial wilt of cucumbers, squash, and melons generally [Erwinia tracheiphila].

Diseases Unusually Severe: The heaviest and most widely distributed outbreak of cucumber angular leaf spot [Phytomonas lachrymans] occurred that has been observed during the past 12 years. Although it was most pronounced in the pickle growing area of the Connecticut River Valley, it was observed also in Bristol, Plymouth, and Worcester Counties. In

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* Insert before [G. aridum]: "[Gloeosporium syringae] of lilac, and anthracnose"

most seasons it is either totally absent or extremely scarce. It appeared not to be limited to crops grown from non-disinfected seed or to fields where cucurbits were grown in 1940. As in former years, only traces of fruit infections were observed.

Cucumber mosaic [virus], likewise, appeared to reach a new high level of damage to slicing and pickling cucumbers this year, at least throughout the Connecticut Valley as well as in various other sections of the State. Like bacterial wilt, it appeared to be directly associated with high populations of the striped cucumber beetle, both diseases being of slight importance where the beetles were scarce.

The X disease (yellow-red virosis) of peach appeared to be unusually conspicuous on the native chokecherry. The yellow-to-red colors appeared earlier in the season than usual and were unusually brilliant. Furthermore, the disease was observed farther north in Franklin County on both peaches and chokecherries than in past seasons. Colored chokecherry bushes were present along the highways from Amherst to Brandon, Vermont. Surveys again this year failed to reveal the disease in Barnstable, Bristol, Essex, and Plymouth Counties.

Downy mildew [Peronospora tabacina] and damping-off in tobacco beds were somewhat more severe than in most past seasons. Bacterial ring rot [Phytomonas sepedonica] of potato was far more prevalent than in past years, particularly in the Connecticut Valley and in Bristol County. In the latter county, several lots of non-certified seed from Maine that contained ring rot were planted in the Westport-Dartmouth section. In the former area, the disease had its origin in several carloads of certified Chippewa seed potatoes from Maine. Infected tops varied from 10 percent to 50 percent of the hills, but the amount of tuber decay in most cases was less than expected, usually under 10 percent. One grower in Franklin County, however, reported a loss of at least one-third of his crop from tuber decay. The same fields of Chippewa potatoes in the Connecticut Valley contained mostly from 50 percent to 90 percent leafroll in addition to the bacterial ring rot. The yields in most of those fields were no more than one-third to one-half normal for the season concerned. Evidently there occurred a slip somewhere in the channels of certification that allowed such stock to be shipped under certificate tags.

New and Unusual Diseases: The Fusicoccum canker [F. amygdali] of peach in Plymouth County appeared to be much more damaging to the orchard in June than was indicated in April (U. S. Plant Dis. Rptr. 25:9:273, 1941). No additional cases were encountered during the season. Strawberry red stele (Phytophthora fragariae], identified for the first time this year in Massachusetts (and confirmed by J. B. Demaree, U.S.D.A.) outside of experimental plantings, appeared to be restricted to a few fields in Bristol County. First observed around mid-June, it was confined mostly to Howard 17 and to fields where strawberries had been grown in recent years. Following the wet season of 1940, rainfall for June this year in Bristol County likewise was far above normal, thus no doubt favoring the further development of the disease wherever the fungus was established.

Black pox of apple [Helminthosporium papulosum], reported earlier in the year from Plymouth County (U. S. Plant Dis. Rptr. 25:8:249, 1941),

was examined during August in the original orchard. Branch infections were heavy on Red Astrachan, moderate on Red Delicious and Northern Spy, light on Wealthy, and absent on McIntosh, Baldwin, Gravenstein, Dutchess, King, and Stayman Winesap. Leaf infection was present on Red Astrachan only, and no fruit spots were observed at all. This small orchard was in rather low vigor and had received only partial spray programs in past years. In a larger, better-managed orchard in Marshfield, Red Astrachan trees showed only light bark infections and no leaf spotting, while Northern Spy and several other varieties were entirely free of black pox. In October, a grower from Fall River, Bristol County reported that the bark stage of the disease has been present for several years on a few trees in his orchard.

Bacterium vesicatorium [Phytomonas vesicatoria] spot commonly occurs on peppers in Massachusetts practically every year, but this is the first time during the past 12 years I have observed it on tomatoes. The disease was present in Worcester County where the infection was heavy on Victor and light on two other varieties growing nearby. On Victor, about one-fourth of the leaves were dead and most of the remainder spotted, while at least three-fourths of the fruits were moderately to heavily spotted. The grower stated the disease was present only on Victor in the plant bed. The only treatment the seed had received was a dusting with cuprous oxide for damping-off control. Oddly, the disease was not observed elsewhere in the State, even in Bristol County where the weather was much damper this year and where Victor, obtained from the same seedhouse was being tried out on several farms.

This is the first season, also, during the past 12 years that cabbage yellows [Fusarium conglutinans] became a problem. It was present in Essex County in every field visited during mid-season, where plant infections ranged from 5 to 75 percent. The heaviest loss was estimated at 25 to 30 percent. Growers in that area reported they had observed it from time to time during the past 15 years but that in most years the losses had been very light. On one farm where the seed of several varieties was sown in one field and a portion of the plants transplanted in other fields, Penn State and Golden Acre were heavily infected while Copenhagen (probably a resistant strain) showed only light symptoms on a very small number of plants. Two very light infections were observed also in Hampden County and one in Middlesex County, the only ones outside the extensively infected area of Essex County.

Sphaceloma scab of Plantago (plantain) was first identified (and confirmed by Anna E. Jenkins) in Massachusetts this year. The disease was observed in several parts of the State. A specimen of bacterial leaf blight (cause undetermined) of plantain lily was submitted from Plymouth County during June. A specimen of rose cane showing coryneum gall and canker (apparently C. microstictum) was submitted during June from Walpole, New Hampshire, and identified by B. H. Davis, New Jersey.

In Bristol County, where rainfall was above normal during June and July, one field of cucumbers in Dighton showed marked drooping of the leaves of nearly all of the plants during mid-July. The plants would recover at night and wilt during the day, but only a very few of them had died outright. All affected plants that were examined showed a yellowish

discoloration of the xylem vessels in the crown and in the tap and lateral roots. Tissue plantings yielded a Fusarium identified tentatively by C. D. Sherbakoff as a variety of Fusarium niveum [F. bulbigenum niveum]. The disease was unlike anything observed here previously in cucumbers.

Only occasionally during past years has bitter rot [Glomerella cingulata] of apples been observed in Massachusetts, and then only in the southeastern part of the State. One severe case of fruit infection was observed in Bristol County on Rhode Island Greening. Some of the fruits were literally freckled with small lesions, resembling apples heavily affected with Jonathan spot. Others showed only a few typical, large lesions with the characteristic concentric rings of spore pustules. The orchard concerned received the complete schedule of sulfur sprays, but with inadequate dosage and distribution of spray material. Like Brooks' spot [Mycosphaerella pomi], which also occurs mostly in the three southeasternmost counties, bitter rot has never been observed even there to reach destructive proportions in orchards that are given year after year a spray program that is scab-tight for McIntosh.

One case of the nematode disease, spring dwarf of strawberries, was observed outside Cape Cod, a very light infection on Fairfax in Bristol County (Confirmation by J. R. Christie, U.S.D.A.).

Possible Reasons for Unusual Diseases: As indicated in Table 1 on page 2, the mean temperature for the State was above normal for each month from April to October except in August when it was about normal. The greatest departure from normal was during April, +5.3°F, when the soil no doubt warmed up considerably and then apparently remained unusually warm through June and July. This situation probably accounted for the unusual incidence of cabbage yellows in which the fungus is reported to be active only at temperatures above 63°F, and to reach its most favorable range of growth at 80-90°F. Ordinarily, the disease is of little or no consequence, even when susceptible varieties are grown, in the southern and northernmost States where the soil temperatures are too high and too low, respectively. The same warm season may be the explanation also for the presence of apple bitter rot and of the cucumber fusarium wilt in Bristol County, and possibly also for the outbreak of cucumber and tomato bacterial leaf-spot diseases.

The normal or above normal situations for several diseases in Bristol County might well be explained by the marked excesses of rainfall in June and July (Table 2), together with the heavy dews and fogs that usually prevail there during July and August. Scattered, light secondary infections of potato late blight were observed July 3. The disease assumed epidemic form during mid-July and destroyed many unprotected fields, but remained relatively inactive until the first week of August when it again developed freely on unsprayed or poorly sprayed vines. The only definite cases of tomato late blight reported in the State this year were observed there early in August; and at the same time cucumber downy mildew was spreading freely. In fact, there were indications on one farm in Dighton that this disease, which was not observed elsewhere in the State until the first week of September, had become established around mid-July.

Weather conditions were even more favorable for diseases in Barnstable County (Table 2) than in Bristol County, but very little information is available concerning losses because of the few and limited surveys made there. Disease losses were none-to-negligible in Essex, Middlesex, and Worcester Counties, excepting those due to underground infections, such as Rhizoctonia sprout rot and scab of potato and cabbage yellows, and excepting mosaic and bacterial wilt of the cucurbits. A glance at the rainfall records for those counties in Table 2 will reveal the marked summer drought conditions that prevailed, particularly in Middlesex and Worcester Counties.
(MASSACHUSETTS STATE COLLEGE)

FRUIT DISEASES IN IDAHO IN 1941

Earle C. Blodgett

The following list of fruit diseases has been compiled from the records of inquiries and of field observations on occurrence and prevalence during 1941. Most of the notes were made during field trips of June 10 to 26, July 9 to 14, July 30 to August 3, August 18 to 21, and September 1 to 13. These trips were not strictly of a survey nature and the following records were taken incidental to other work. Thus the list is complete only in that it includes all diseases observed in 1941. The report is similar to those for 1936-1940.

Parasitic Diseases

1. Coryneum blight (Coryneum beijerinckii Oud. [=Coryneum carpophilum (Lév.) Jauch] of peach did more damage this year than ever reported before. Fruit infection with severe gumming was the most important type of injury. Twig cankering was particularly bad on some trees. (February - September).
2. Coryneum blight of apricot was general, causing leaf and fruit spotting. (June - July).
3. Coryneum blight of sweet cherry caused more damage than ever noted before. Infection was severe in some orchards of Lewiston, Orofino, and in one at Caldwell. Leaf spotting and fruit infection caused a heavy leaf fall and considerable loss of fruit. (May - July).
4. Cornyeum blight of sour cherry caused heavy leaf fall and fruit infection in some orchards at Lewiston. This represents the first record of this disease on sour cherry in Idaho. Greenhouse tests this year gave abundant leaf spotting of Montmorency cherry with isolates of Coryneum. (April - July).
5. Coryneum blight of prune (both Italian and French) was very bad in a small planting near Troy and one at Caldwell. Although the foliage was covered with lesions, the leaves did not fall. Fruit infection was very common especially on the French prune. This is the first record of extensive natural infection of prune in Idaho. (June - July).

6. Powdery mildew (Podosphaera spp.) was less severe on sour cherry in orchards near Weiser. (June - September).
7. Powdery mildew of Jonathan apple caused some damage at Emmett and Caldwell and was common at Council. (June - August).
8. Powdery mildew (Sphaerotheca mors-uvae (Schw.) Berk. and Curt.) of gooseberry was found on plants at Moscow and Emmett. (May - June).
9. Powdery mildew (S. pannosa (Wallr.) Lév.) of peach was an important disease generally. One grower reported that upon removing two heavily infected nectarine trees from a peach orchard, powdery mildew became of much less importance. (June - September).
10. Powdery mildew (S. humuli (DC.) Burr.) on raspberry was noted at Moscow. (June).
11. Fire-blight (Erwinia amylovora (Burr.) Winslow) of pears was severe this year. In artificial inoculation field tests at Moscow many trees were completely killed. (May -September).
12. Fire blight of apple was widely scattered as blossom blight and twig killing. (June).
13. Fire blight was severe on quince at Lewiston and Moscow. (May - June).
14. Crown gall (Phytomonas tumefaciens (Erw. Sm. & Towns.) Bergey et al.) of boysenberry canes caused extensive damage in plantings at Emmett, Fruitvale, and Sandpoint. The disease was also noted at Moscow on loganberry and blackberry. (May - August).
15. Crown gall was noted on cherry at Moscow. (April).
16. Crown gall was noted on pear at Moscow. (March).
17. Perennial canker (Neofabraea perennans (Zeller & Childs) Kienholz) was common on apple trees and fruit in northern Idaho orchards. Cankers were found also on Jonathan at Council and considerable damage was noted on stored fruit near Boise. This represents the first record of the disease in southern Idaho. (February - August).
18. Leaf curl (Taphrina deformans (Berk.) Tul.) on peach caused almost complete defoliation of unsprayed trees in northern Idaho. It was more serious this year in southern Idaho also.
19. Leaf spot, cane canker, and dieback of youngberry, boysenberry, and blackberry were serious as usual in most plantings. (Septoria spp. and Glomerella cingulata (Ston.) Spauld. & Schrenk.) These diseases are regarded as one of the most important limiting factors in youngberry and boysenberry production in Idaho. (June - August).
20. Currant anthracnose (Pseudopeziza ribis Kleb.) caused complete defoliation of red currant plants at Moscow. It was noted also at Sandpoint. (May - August).
21. Strawberry leaf spot (Mycosphaerella fragariae (Tul.) Lindau) was widespread and did considerable damage. (March - June).
22. Strawberry leaf scorch (Diplocarpon earliana (Ell. & Ev.) Wolf), tentatively identified in Idaho since 1937, did considerable damage in one planting near New Meadows this year. Dr. A. G. Plakidas positively identified the fungus on material collected September 1941.
23. One of the slime molds (not determined) caused considerable anxiety to the grower when about 10 percent of the plants in a commercial strawberry planting near Caldwell were attacked. Development of the fungus was noted about the last of harvest and could still be found in September. Although the fungus is probably not parasitic in the usual

sense it caused some damage to the plants and in the event of earlier development could seriously affect the crop.

24. Blue mold rot (<u>Penicillium expansum</u> (Lk.) Thom.) was common on many hosts. (Storage and shipping seasons).
25. Black mold rot (<u>Rhizopus nigricans</u> Ehr.) was severe on peaches, prunes, and late strawberries. (September - October).
26. Apple scab (<u>Venturia inaequalis</u> (Cke.) Wint.) was generally present in northern Idaho and more prevalent than usual. (June - August).
27. Brown rot (<u>Sclerotinia</u> sp.) was common and caused extensive damage to sweet cherries at Lewiston and on prunes and apricots at Moscow. The disease apparently is now well established in the Lewiston district and this represents the first record of brown rot in commercial orchards in Idaho. (May - June).
28. Several peach trees on the Salmon River below Salmon City were killed by a root rot. Although identification is not positive, <u>Armillaria mellea</u> Vahl ex Fr. is probably involved. The affected trees were located on recently cleared land.

Non-Parasitic Diseases

1. Winter injury was very slight again this year.
2. Black end of pear was noted as usual. (September).
3. Drought spot or gum spot of prunes was general but not uniform in occurrence. (September).
4. Cracking of sweet cherries was extremely severe in the Lewiston, Emmett, and Caldwell sections. The injury complicated packing and shipping operations because of rot fungi. (June).
5. Drought spot and corky core of apples was less severe this year. (August - September).
6. Bitter pit was noted at St. Maries. (August).
7. Lime-induced chlorosis was much more severe this year than last. Pears, apples, and small fruits were seriously affected.
8. Spray injury. The season was characterized by severe damage to apples, prunes, and peaches in many orchards.
   (a) In orchards at St. Maries, Wilder, and Meridian some apple trees were nearly defoliated in August and September. Excessive rainfall and heavy arsenical spray applications presumably accounted for the unusual damage. In some cases fruit burning occurred in the field.
   (b) Generally, where calcium arsenate was dusted on prunes for the control of the snowy tree cricket, severe damage occurred. The burning and defoliation was definitely correlated with the periods of excessive moisture. Loss of foliage frequently caused the prunes to shrivel and fall prematurely. Much of the leaf spotting could not be distinguished from that known as prune leaf spot perpetuated in budded stock (Phytopath. 40: 347-348. 1940).
   (c) Peach trees sprayed with arsenate of lead for twig borer showed mild to severe leaf and twig damage from arsenical burn. Where peaches were interplanted with apples almost complete defoliation frequently occurred.

9. The leaf spotting and defoliation of apricot and peach noted for several years has been shown to be due at least in part to arsenical residues in the soil. The disease has been named systemic arsenic toxicity (PDR 25:549-551. Dec. 1, 1941). Injury was not quite so severe this year.
10. Extensive loss of young prune trees was observed in one orchard and reported from others, due to injury from the use of ethylene dichloride for control of peach borer. In the case noted, the operator used the solution recommended for old trees on younger replants and adjoining young trees. The trees died any time during the season following application and losses often amounted to over 50 percent.

Virus Diseases

1. Raspberry mosaic (types not separated) was as serious as usual. Mosaic was also recorded on all other common types of brambles. One very severe case of mosaic on blackberry was noted at Boise.
2. Cherry mottle leaf was noted in widely scattered places. Decline in vigor of affected trees was especially marked in an orchard at Council. One new tree was located at Emmett, the first record in that area.
3. Peach mottle was observed on the original tree at Emmett, but no new cases were observed. When buds from mottle-infected trees are placed on healthy Bing and Montmorency cherries, a severe mottling and necrosis of foliage occurs on the Bing and a terminal die back and gumming of twigs result on the Montmorency.
4. Peach wart has been shown by many budding and inarching tests during the past two years to be caused by a transmissible factor, probably a virus. In one orchard there are several new trees affected this year and injury is more severe on others. Variations in symptoms have given rise to terms such as beady wart, ring wart, and smooth wart. No tree symptoms are recognized except that one tree bearing warty fruits shows mottled foliage very similar to peach mottle.
5. The disease under observation and test since 1936 is now definitely regarded as the Western X-disease. Transmission tests in 1940 and 1941 showed successful transmission from peach to peach. Western X-disease is regarded as one of the most serious disease of peach in Idaho and losses have already been considerable.

Miscellaneous Diseases - Causes Undetermined

1. Strawberry
   (a) The "mildew-like" growth on petioles, pedicels, and fruit was noted on one lot of specimens sent in again this year. Cause is not determined.
2. Italian Prune
   (a) Leaf curl was noted as usual. Evidence accumulated by entomologists indicatesthat the type of leaf curl referred to here (and in earlier reports) is caused by the feeding of certain mites.

(b) Leaf spot was severe again this year and considerable damage to ripening fruit was caused by early defoliation. Transmission tests show that all shoots from diseased buds developed leaf spot but the stocks remained normal. The type of injury was difficult to distinguish from that due to arsenical burn. (See spray injury).
(c) The chlorosis and malformation of prune foliage in the orchard near Weiser is probably a form of rosette (zinc deficiency).
(d) The leaf deformity of Italian prune at Fruitland is still under test.
(e) A condition referred to as gherkins or prune pickles was noted but there apparently was no damage.
(f) A peculiar condition on Italian prune was seen in September in a young orchard near Payette. Several trees either partly or completely dead showed an abundant, rusty thin exudate on the main branches and trunk. The trees wilted suddenly with the leaves persisting as in fire-blight but no definite cankers were found. The writer has never seen a similar type of disease and the prominent residue from the exudate is very interesting. Preliminary isolation tests were not successful.
(g) Enlarged nodes is a term given to a condition of Italian prune twigs which has been observed many times. Some trees are more affected than others and usually there is great variation in each tree. The tissue below the bud "puffs out" to 2 or 3 times the normal twig size. No apparent injury is associated.

3. Apricot
(a) The leaf blotch condition previously noted is now regarded as caused largely by arsenical residues in the soil. (See non-parasitic diseases, No. 9).
(b) The trouble noted at Weiser is probably a form of rosette (zinc deficiency).
(c) The so-called physiological spotting of apricot fruit was again general.
(d) The die back, defoliation, and leaf deformity condition reported last year on the tree at Bonners Ferry was not present this year.
(e) Loss of young trees in certain orchards, sometimes exceeding 50 percent, was noted this year. Cankers on trunk and main branches often produced complete girdling. The diseased area extended about to the ground level and the roots and crown generally were uninjured. The disease has been tentatively regarded as bacterial gummosis.

4. Cherry
(a) The diagnosis of the trouble on suspicious trees near Weiser is not certain but similar to those of pink fruit.
(b) The cherry rosette trouble near Weiser noted for several years is probably due to zinc deficiency.
(c) The red leaf of chokecherry is widespread and "seems" to be associated with the Western X-disease of peaches.
(d) Extreme fasciation of young sweet cherry trees at Moscow was noted.

(e) Loss of young trees in many widely scattered orchards has been serious this year. Symptoms appear to be similar to those of bacterial gummosis. (See Apricot (e)).
(f) In one orchard at Twin Falls many old, mature trees died outright during the summer. After limited observations no good explanation of the cause could be made. Such a sudden extensive loss is probably not due to natural old age.

5. Peach
   (a) Western X-disease (See virus diseases).
   (b) Systemic arsenic toxicity. (See non-parasitic diseases).
   (c) One new case of calico was noted this year.
   (d) Wart. (See virus diseases).
   (e) The rough bark condition has increased in severity in the orchards where noted.
   (f) "Yellow spot" on peach foliage was noted for the first time in an orchard in southern Idaho. It was less severe at Moscow.
   (g) Extreme development of the bluish-green color on peach foliage was noted on the trees in the Station orchard at Parma.
   (h) The marginal leaf spot trouble was less severe this year.
   (i) A trouble seen before but not reported was serious this year in two orchards near Caldwell. Excessive gumming occurred around pruning wounds and bark splits on the main branches. Although similar to "rough bark" it seems to be distinct.
   (j) Rusty spot was worse this year in the two places where it has been observed. Tests are under way to determine the cause.
6. Apple - The collar rot reported last year continues to be a problem but no studies have been made.

The 1941 season was characterized by a pronounced increase in the amount of damage done by parasitic diseases, particularly those caused by fungus parasites. This is probably due to more moist weather than usual and a build up of inoculum. The wet weather likewise probably accounts for unusual arsenical damage.
(IDAHO AGRICULTURAL EXPERIMENT STATION, MOSCOW)

DISEASES OF FRUITS AND VEGETABLES ON THE NEW YORK MARKET DURING THE MONTHS OF JANUARY TO AUGUST, INCLUSIVE, 1941

C. O. Bratley and James S. Wiant

APPLES

Internal browning of Eastern-grown Rhode Island Greening Apples was more severe than has been noted in any recent year on the New York market. During January the disease was found in a few lots grown in Western New York and by February it was general in Greenings from this district. In 12 carlots examined during the latter month, approximately 10 percent of the apples had flesh that was browned severely enough to affect their market demand.

Apples in one carlot held in storage at New York were examined periodically. About 5 percent were found affected by the first week of February, 8 percent by the last week of February, and 23 percent by the last week of March. Fruit removed from storage at the time of the two latter examinations and held at room temperature (70°F) for 6 days, showed over half again as much browning as when removed. Large fruits were more generally affected than small ones. Apples showing blush areas on the skin were less affected than entirely green fruits.

Blue mold rot (Penicillium expansum) continued to be the most important decay found in apples from Washington and Oregon. Of the 385 cars of apples from this district inspected by market inspectors 1/ during the period from January to May, only 17 were free from the decay and in the remainder an average of 2.7 percent of the fruits were affected.

ASPARAGUS

Phytophthora rot (Phytophthora sp.) and bacterial soft rot (Erwinia carotovora) were of importance on California asparagus during the first week or 10 days of the season which extended roughly from early March to early May. For 3 weeks thereafter practically no decay occurred. Then throughout the final 3 or 4 weeks of the season both decays were again prominent.

An examination of terminal inspection records 1/ covering 136 carloads showed that phytophthora rot alone was reported in 16 cars, bacterial soft rot alone in 17 cars, while both occurred together in 41 additional cars. An average of 3 to 4 percent of stalks were affected in the 74 carloads, with the two decays assuming about equal importance.

CAULIFLOWER

Ring spot (Mycosphaerella brassicicola) occurred as an important blemish of the jacket leaves of California cauliflower arriving on the market in early April.

CELERY

Throughout January and February considerable pithiness was noted in the outer leaf stalks of California celery. During this period market inspectors 1/ reported the defect in over half of the cars, with an average of 19 percent of the stalks showing 3 to 5 outer leaf stalks so affected. Bacterial soft rot (Erwinia carotovora) and watery soft rot (Sclerotinia sclerotiorum) were reported prevalent from the first of the year clear through the season which after mid-February continued in light degree through March, April, and May. A summary of the reports indicated an average of 14 percent decay in 141 cars out of a total of 169. Much of this occurred in early stages with only portions of the leaves and small leaf branches affected. Late blight (Septoria apii-graveolentis) was found in high amount during the latter part of the season.

1/ These data are based on condition inspection reports issued by the U. S. Agricultural Marketing Service. They cover most of the carloads handled by a given group of receivers. There is represented, therefore, a good cross-section of the total market receipts of this commodity.

Florida celery was even more severely affected with pithiness during the first two months of the year. Thus inspection records indicate an average of 34 percent of the bunches with 3 to 5 outer leaf stalks affected in 87 of the 120 carlots examined. Very little was found during March, April, and May. Decay (both bacterial soft rot and watery soft rot) was found to an average extent of 6 percent in 77 cars out of a total of 411 inspected during the entire 5-month period. Both early blight and late blight were found in a few cars.

Celery from both States was practically free of blackheart, the disease being observed in an occasional car.

CHERRIES

California cherries arriving on the New York market were more severely affected with brown rot than in any of the ten previous seasons during which observations have been made. Frequently 20 to 40 percent of the fruit in a lot was affected. During the marketing period of 2 or 3 days at summer temperatures, the percentage of infection increased greatly so that certain lots became unsalable because of brown rot. Isolations made from infected cherries selected at random over a period of several weeks revealed that most of the rot was caused by Sclerotinia fructicola. About 3 percent of the cultures proved to be S. laxa.

ENDIVE (Chicory)

A car of Arizona endive received at Albany in early February was seriously affected with tipburn. In approximately 60 percent of the heads many leaves were speckled with scattered reddish spots over the midribs and had a similar reddish discoloration along their margins and tips.

ONIONS AND GARLIC

Sclerotium bataticola was found causing a dry rot of the outer scales of a single Valencia-type Texas onion bulb observed in early July. The lesion was approximately one inch in diameter and occurred near the base of the bulb. Normal brown pigment had disappeared over the affected area of the scales, which were papery thin, ash gray in color, and covered with the minute sclerotia of the pathogen.

The same fungus had previously been found affecting the outer scales of Chilean garlic received in early April.

Although in neither instance was the decay of commerical importance, the occurrence of the fungus on onion and on garlic is of unusual interest.

ORANGES

Diplodia and Phomopsis stem-end rots of citrus fruits from Florida, which usually take heavy toll in late spring shipments, were found in unusually small amounts this season.

PEAS

Anthracnose (Coletotrichum pisi) was found in a carlot of Texas peas received on the market in late February. At the time when the several-pod sample was brought to us for identification, the peas had already been distributed through trade channels. Although it was thus

impossible to determine the extent to which the disease was present, the produce inspector who examined the car reported that approximately 18 percent of the pods showed small brown sunken spots. We had not previously seen this disease on the market.

PEARS

In 3 cars of Anjou Pears from Washington, cork affected from 3 to 10 percent of the fruit. Most cases were mild with but little dimpling of the surface. However, affected areas were scattered throughout the flesh. An occasional lot of Anjou pears arriving from Argentina in March showed small percentages of the same trouble.

Blue mold rot (*Penicillium expansum*) was the most important decay of western-grown pears, affecting an average of about 2.5 percent of the fruit arriving during the first three months of the year.

POTATOES

A few California potato tubers forwarded for diagnosis from the Buffalo market in mid-July were found affected with a shallow, slightly soft, cream-colored stem-end decay. Isolations uniformly yielded *Sclerotium bataticola* (*Rhizoctonia bataticola*). Aside from minor variations in the size of the sclerotia the potato isolates were found identical with those recently obtained from garlic, honey dew melon, onion, and sweet potato. Although the pathogen has been reported on potato in Cyprus, India, and Palestine, a preliminary search of the literature indicates that the only previous report for the United States is that of Boyd (Plant Disease Reporter 11:p.75, July 15, 1927), who found it affecting both tubers and vines in a Georgia field.

SPINACH

Texas spinach arriving during the first three months of the year showed three important market troubles, namely, budworm injury, downy mildew (*Peronospora effusa*), and white rust (*Albugo occidentalis*).

Of 318 carlots examined by market inspectors [1/] only 63 were free of one or more of these troubles. Budworm injury was reported in 150 cars with an average of 16 percent of the plants affected. Downy mildew was found in 106 cars with an average of 13 percent of the spinach affected. So far as the market occurrence of white rust is concerned this has undoubtedly been the worst year since the disease was first observed in 1937. An average of 18 percent of the plants in 69 carloads (about 22 percent of the total carloads inspected) had from 2 to 5 outer leaves affected with the disease.

TOMATOES

Phomopsis rot was again observed in Texas tomatoes arriving on the market in early July. The decay was also noted in a carlot of Mississippi tomatoes that arrived about the same time.

WATERMELONS

The chief defects of southern watermelons received on the market during June, July, and August were bruising, anthracnose (*Colletotrichum lagenarium*), and stem-end decay (*Diplodia* spp.).

Bruising consisted chiefly of chafing injury where the melons had rubbed against the side of the car, or pressure bruises where melons were in contact with the car floor. No evidence of chemical injury was noted during the course of several visits to the unloading yards.

Although anthracnose was prevalent in high percentage, it occurred in early stage and was therefore chiefly a rind blemish.

A special effort was made to determine how extensively bordeaux paste was being used for controlling stem-end rot. In relatively few cars was there any evidence of its use.

Through the courtesy of the Railroad Perishable Inspection Agency, a random sample of 50 inspection reports were examined for each of the three months, June, July, and August. Practically all June cars were from Florida. Those received in July and August represented a number of southern States with Georgia predominating in July and North Carolina in August. The information obtained from the inspection records for the 150 carlots may be summarized as follows:

Decay was noted in 25 cars with an average of about 5 percent, mostly stem-end decay. On the basis of the total 150 cars, the average incidence of decay was approximately 0.5 percent. There was little difference in amount of decay during the different months.

Anthracnose was noted in 16 cars in June, 38 cars in July, and 46 cars in August, with an average of 14 percent in the 100 cars. On the basis of the total 150 cars, the average incidence was about 9 percent.

Stem-end treatment with bordeaux paste was noted in 16 cars in June, 7 cars in July, and 8 cars in August. In many cases less than half of the melons in the car showed evidence of treatment. From this it can be seen that only about 20 percent of the 150 cars showed evidence of stem-end treatment.

Rejection of melons by receivers on account of decay - The information noted above was based on an inspection of exposed melons before unloading. Actual counts of melons rejected by receivers on account of decay were found to be 13 melons per car in 40 cars in June, 27 melons per car in 44 cars in July, and 72 melons per car in 44 cars in August. Assuming that an average of 925 melons are loaded per car, approximately 3.5 percent of the melons in all 150 cars were rejected for decay. By months the rejected melons averaged about 1 percent in June, 2.5 percent in July, and 7 percent in August.
(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES)

GRASS DISEASES IN WISCONSIN IN 1941[1/]

J. Lewis Allison and D. W. Chamberlain

This report of grass diseases deals primarily with those diseases found in the grass nurseries at Madison, Wisconsin. It includes, however, diseases which have been collected or observed on other common grasses in various regions of the State.

Weather conditions during the late spring and early fall were favorable for the development and spread of many of the foliage diseases.

1/ Cooperative investigations of the Wisconsin Agricultural Experiment Station and the Division of Forage Crops & Diseases, Bureau of Plant Industry, U. S. Department of Agriculture.

The leaf rusts of blue grasses caused by Puccinia poae-sudeticae and P. rubigo-vera reached epiphytotic development early in the season and were especially severe during the fall. Anthracnose and leaf blight of Sudan grass caused by Colletotrichum graminicolum and Helminthosporium turcicum were extremely prevalent in the Sudan grass nursery. Many lines were completed defoliated by these two fungi during the early fall. Ideal environment for disease development, plus the fact that the Sudan grass nursery has been grown on the same plot for 11 consecutive years, permitting a gradual build up of inoculum, were likely responsible for the severe attack by these two fungi. Other common grass pathogens did not attain the epiphytotic development that was evident during 1940. Powdery mildew of blue grass (Erysiphe graminis) especially, was much less severe than in previous years.

The relative severity of the principal types of diseases on pasture grasses grown at Madison, Wisconsin is given in Table 1. The 1941 collections and observations are summarized in a host index.

Table 1. Relative Severity of the Principal Types of Diseases on Pasture Grasses at Madison, Wisconsin.[a/]

Common name of grass	The diseases and their relative severity						
	Mildew	Ergot	Leaf Rust	Stem Rust	Smuts	Leaf Spots	Anthracnose
Bluegrass, Kentucky	S	L	S	-	L	M	-
Bluegrass, Canada	-	-	-	L	-	S	-
Brome, smooth	-	M	-	-	-	S	-
Redtop	-	-	L	-	-	L	-
Timothy	-	-	-	L	M	L	-
Reed Canary	-	L	-	-	-	L	-
Quack Grass	-	M	L	S	L	L	-
Sudan Grass (annual)	-	-	-	L	L	S	S

a/ Rated as Severe (S), Moderate (M), and Light (L).

Host Index

Agropyron repens (L.) Beauv.
Ergot - Claviceps purpurea (Fr.) Tul.
Tar spot - Phyllachora graminis (Pers.) Fckl.
Leaf smut - Urocystis agropyri (Preuss.) Schröt.
Stem rust - Puccinia graminis Pers.
Leaf rust - P. rubigo-vera (DC.) Wint.
Leaf spot - Septoria agropyri Ell. & Ev.
*Bends - Cause undetermined.

Agropyron smithii Rydb.
- Ergot - Claviceps purpurea (Fr.) Tul.
- Stem rust - Puccinia graminis Pers.

Agrostis alba L.
- Leaf rust - Puccinia rubigo-vera (DC.) Wint.
- Brown stripe - Scolecotrichum graminis Fckl.

Bromus inermis Leyss.
- Bacterial spot - Phytomonas coronafaciens (Elliott) Bergey et al. var. atropurpurea (Reddy & Godkin) Magrou
- Ergot - Claviceps purpurea (Fr.) Tul.
- Leaf spot - Selenophoma bromigena (Sacc.) Sprague & Johnson
- Leaf spot - Septoria bromi Sacc.
- Leaf spot - Helminthosporium bromi Drechs.
- Leaf scald - Rhynchosporium secalis (Oud.) Davis
- Leaf spot - Cause undetermined, probably non-parasitic
- *Bends - Cause undetermined
- **Head proliferation - Cause not definitely known; a Sclerospora sp. was observed in some heads.

Dactylis glomerata L.
- Powdery mildew - Erysiphe graminis DC.
- Ergot - Claviceps purpurea (Fr.) Tul.
- Brown stripe - Scolecotrichum graminis Fckl.

Elymus canadensis L.
- Mildew - Erysiphe graminis DC.
- Tar spot - Phyllachora graminis (Pers.) Tul.
- Leaf smut - Urocystis agropyri (Preuss.) Schröt.
- Stem rust - Puccinia graminis Pers.
- Leaf spot - Septoria elymi Ell. & Ev.
- Brown stripe - Scolecotrichum graminis Fckl.

Hordeum jubatum L.
- Mildew - Erysiphe graminis DC.
- Head smut - Ustilago bullata Berk.
- Stem rust - Puccinia graminis Pers.
- Leaf rust - Puccinia rubigo-vera (DC.) Wint.
- Brown stripe - Scolecotrichum graminis Fckl.

Panicum virgatum L.
- Tar spot - Phyllachora graminis (Pers.) Tul.
- Leaf rust - Puccinia panici Diet.
- Leaf rust - Uromyces graminicola Burrill
- *Bends - Cause undetermined

Phalaris arundinacea L.
- Powdery mildew - Erysiphe graminis DC.
- Ergot - Claviceps purpurea (Fr.) Tul.

Phleum pratense L.
Stripe smut - Ustilago striaeformis (Westend.) Niessl
Stem rust - Puccinia graminis Pers.
Leaf rust - P. rubigo-vera (DC.) Wint.
Brown stripe - Scolecotrichum graminis Fckl.

Poa compressa L.
Stem rust - Puccinia graminis Pers.
Brown stripe - Scolecotrichum graminis Fckl.

Poa pratensis L.
Powdery mildew - Erysiphe graminis DC.
Ergot - Claviceps purpurea (Fr.) Tul.
Stripe smut - Ustilago striaeformis (Westend.) Niessl
Leaf rust - Puccinia rubigo-vera (DC.) Wint.
Leaf rust - P. poae-sudeticae (Westend.) Jørstad
Leaf spot - Septoria sp.
Leaf spot - Helminthosporium vagans Drechs.

Setaria lutescens (Weigel) F. T. Hubb
Downy mildew - Sclerospora graminicola (Sacc.) Schröt.
Head smut - Ustilago neglecta Niessl
Leaf spot - Piricularia grisëa (Ckë.) Sacc.

Sorghum vulgare Pers. var. sudanense (Piper) Hitchc.
Bacterial spot - Phytomonas andropogoni (E. F. Smith) Bergey et al.
Kernel smut - Sphacelotheca sorghi (Lk.) Clint.
Leaf rust - Puccinia purpurea Cke.
Leaf blight - Helminthosporium turcicum Pass.
Anthracnose - Colletotrichum graminicolum (Ces.) Wilson
Leaf spot - Cause undetermined, probably non-parasitic
*Bends -Cause undetermined

* This is the first report on these hosts for this peculiar malformation which has been called "Hairpin disease" and more recently "Bends."

** This proliferated head malformation is in some respects similar to that described as crazy top in corn for which no causal organism has been reported. Symptoms on smooth brome agree with those caused by downy mildew on various grasses and there is one report in the literature of a downy mildew on Bromus commutatus Schrad. Head proliferation of several grasses has been reported by some as resulting from adverse environmental conditions.

CROWN GALL ON THE WEED, MALVA ROTUNDIFOLIA

E. M. Hildebrand and L. M. Massey

During the autumn of 1941 fleshy galls were noticed just above ground level on a considerable number of plants of the common round-leaved mallow (Malva rotundifolia L.) on the south side of the Plant Science Building at Cornell on a spot of lawn where for some unknown reason the lawn grass was rather thin and the weed very abundant. The galls were located at the crowns where wounds could have been produced by the lawn mower during the growing season. In size they ranged from a few millimeters to over an inch in diameter. Many of the older galls were in an advanced state of decay.

The bacteria isolated from the young light-color galls were typical of the crown gall organism in culture and when inoculated into tomato induced galls apparently identical to those induced by a stock culture of this organism [Phytomonas tumefaciens].

Other species of the Malvaceae (Mallow family) known to be crown gall suscepts, according to the literature, are the hollyhock (Althaea rosea Cav.) and rose mallow or swamp hibiscus (Hibiscus moscheutos L.). (NEW YORK STATE COLLEGE OF AGRICULTURE)

CHECK LIST REVISION

Freeman Weiss

PRUNUS. APRICOT, CHERRIES, and PLUMS, including ornamentals. For almond and peach see Amygdalus.

Occurring on various or undetermined Prunus spp.

Alternaria sp., fruit rot. On P. cerasifera, Mich.; on P. domestica, Idaho & Oregon.
A. citri Ell. & Pierce, blossom end rot, fruit spot. On P. armeniaca, Calif. Var. cerasi Rudolph, leaf spot. On P. avium. Calif.
Armillaria mellea Vahl ex Fr., root rot. Cosmopolitan.
Botrytis cinerea Pers., blossom blight, green & ripe fruit rot, gummosis. Cosmopolitan.
Cercospora cerasella Sacc., leaf spot. Conidial stage of Mycosphaerella cerasella.
C. circumscissa Sacc. (C. graphioides Ell.), leaf spot, shot-hole. Widespread.
Cladosporium carpophilum Thüm., scab, usually of fruit, sometimes of foliage & twigs. On Prunus spp. other than P. cerasus. Widespread.
(Clasterosporium carpophilum (Lév.) Aderh.): Coryneum carpophilum
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Coccomyces hiemalis Higgins (Cylindrosporium hiemalis Higgins), leaf spot, shot hole. Chiefly on P. avium, P. cerasus, P. pensylvanica. General. (This and the following 2 spp. have been placed in a

PRUNUS -- continued.

new genus Higginsia by Nannfeldt, and the conidial stage is said to be related more closely to Marssonina than to Cylindrosporium.)
C. lutescens Higgins (Cylindrosporium lutescens Higgins), leaf spot. Chiefly on P. mahaleb, P. serotina, P. virginiana. Widespread.
C. prunophorae Higgins (Cylindrosporium prunophorae Higgins), leaf spot, shot hold. Chiefly on P. americana, P. domestica, P. salicina. Widespread.
Cornularia persicae (Schw.) Sacc., on branches. N.Y., N.Car., Va., Vt.
Corticium stevensii Burt, thread blight. Fla.
Coryneum carpophilum (Lév.) Jauch (C. beijerinckii Oud.), blight, gummosis, pustular spot. Widespread, especially in Pacific Coast States. (Ascospora beijerinckii Vuill., on mummied fruits, has been reported but not confirmed as the ascogenous stage; not recorded in the U.S.)
Cylindrosporium spp. (especially C. padi of American authors). Conidial stages of Coccomyces spp.
Cytospora cincta Sacc. and C. leucostoma Sacc., dieback, twig canker. Conidial stages respectively of Valsa cincta and V. leucostoma. (Other Cytospora spp. reported but probably saprophytic).
Daedalea confragosa Bolt. ex Fr. and D. unicolor Bull. ex Fr., wood rot. Occasional.
Dermatea cerasi Pers. ex Fr. (Micropera drupacearum Lév.), on branches. Widespread. D. prunastri Fr. (Sphaeronema spurium Sacc.), frequently reported, is probably a synonym.
Diaporthe spp., on branches, ? canker. Spp. reported include D. eres Nits. on Prunus spp., D. decorticans (Lib.) Sacc. & Roum. on P. cerasus, D. pennsylvanica (Berk. & Curt.) Wehmeyer on P. pensylvanica & P. virginiana; D. pruni Ell. & Ev. On P. serotina & P. virginiana; D. prunicola (Pk.) Wehmeyer on P. pensylvanica & P. serotina.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. General.
Erwinia amylovora (Burr.) Winslow et al., twig blight. Occasional on various Prunus spp., especially P. armeniaca; sometimes also on P. avium and P. domestica, chiefly on fruit.
Exoascus spp. See Taphrina.
Fomes spp., wood rot, sometimes butt & heart rot of living trees. Spp. reported include F. annosus (Fr.) Cke., N.E. States; F. applanatus (Pers. ex Fr.) Gill., white butt & heart rot, Oregon; F. fomentarius (L. ex Fr.) Kickx, N.E.States; F. fraxinophilus (Pk.) Sacc., Oregon; F. fulvus (Scop. ex Fr.) Gill. (F. pomaceus Pers. ex Lloyd), brown cubical heart rot, widespread; F. igniarius (L. ex Fr.) Kickx, white spongy rot often following black knot, Idaho, Mont.; F. marmoratus Berk., S. Car.; F. pinicola (Sw. ex Fr.) Cke., brown crumbly rot, widespread; F. roseus (Alb. & Schw. ex Fr.) Cke., Oregon; F. subroseus (Weir) Overh., brown cubical heart rot, Pacific Coast States.

PRUNUS -- continued.

Fusicladium cerasi (Rabh.) Sacc., scab. On P. cerasus. N.Y. to Iowa & Wis. Conidial stage of Venturia cerasi Aderh., authentic records of the occurrence of which are not available in the U.S. Also reported on P. americana but this should probably be Cladosporium carpophilum.
Heterodera marioni (Cornu) Goodey, root knot. Southern States, Ariz.
Irpex lacteus Fr., white spongy rot. Widespread.
Lenzites spp., brown sapwood or sometimes heart rot of living trees. L. betulina L. ex Fr., Mich. & N.Y.; L. saepiaria Wulf. ex Fr. and L. trabea Pers. ex Fr., Idaho, Oregon, & Wash.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck (on fruit). Eastern and Central States.
Massaria conspurcata (Wallr.) Sacc., on dead branches. Widespread.
Micropera drupacearum Lév., on twigs. Conidial stage of Dermatea cerasi.
Monilia spp., brown rot, blossom & twig blight. Conidial stages of Monilinia (Sclerotinia) spp.
Monilinia demissa (Dana) Honey, shoot blight. On P. virginiana var. demissa. Idaho, Wash.
M. fructicola (Wint.) Honey, brown rot, blossom blight. On all cult. and various native Prunus spp. General.
M. laxa (Aderh. & Ruhl.) Honey, blossom & twig blight, brown rot. On cult. Prunus spp. Pacific Coast States.
M. seaveri (Rehm) Honey, shoot blight, seedling blight. On P. serotina. Eastern States to Ark. & Iowa.
Mycosphaerella cerasella Aderh. (Cercospora cerasella Sacc.), leaf spot. Eastern and Southern States to Kans.
Nectria sp., trunk & branch canker. On P. serotina & P. pensylvanica. N.E. States.
N. cinnabarina Tode ex Fr., coral spot, dieback. Widespread.
Penicillium spp., blue mold rot. On prunes & cherries. Pacific Northwest.
Phomopsis mali Roberts, bark canker. Va. (Conidial stage of Diaporthe eres ?)
P. padina (Sacc. & Roum.) Died., canker, twig blight. On P. cerasus, N.Y. & Pa. (Conidial stage of Diaporthe decorticans.)
Phoradendron flavescens (Pursh) Nutt., mistletoe. On various Prunus spp. in Central and Southern States. Var. macrophyllum Engelm., Ariz.
Phyllosticta circumscissa Cke. (? P. persicae Sacc.), leaf spot, shot-hole. Widespread.
P. congesta Heald & Wolf, leaf blotch. Ill., Texas, Wis.
P. serotina Cke., leaf spot. N.J. to Ala. & Wis.
P. virginiana (Ell. & Holw.) F.Tassi, leaf spot.* Iowa to Kans. & Mont.
Phymatotrichum omnivorum (Shear) Dug., root rot. On all tested Prunus spp., Texas, Ariz., Okla.
Physalospora spp., on branches. P. fusca N.E.Stevens, S.Car.; P. obtusa (Schw.) Cke., widespread; P. rhodina (Berk. & Curt.) Cke., S.Car.

* This combination by Tassi antedates Seaver's, which is usually cited.

PRUNUS -- continued.

Phytomonas pruni (EFS.) Bergey, bacterial spot, black spot of leaves & fruit, canker. On all cult. Prunus spp., less on native spp. Widespread.

P. syringae (van Hall) Bergey (P. cerasi (Griffin) Bergey), canker, gummosis. Especially on Prunus avium, Pacific Coast States and occasionally in East.

P. tumefaciens (EFS. & Town.) Bergey, crown gall. Widespread.

Phytophthora cactorum (Leb. & Cohn) Schroet., collar rot. Calif., Ind.

P. citrophthora (R.E. & E.H. Smith) Leonian, trunk canker. Calif.

(Plowrightia morbosa (Schw.) Sacc.): Dibotryon morbosum.

Podosphaera oxyacanthae (DC.) DBy., powdery mildew. General. Var. tridactyla (Wallr.) Salm., often reported but confirmed only in Pacific Northwest.

Polyporus spp., wood rot, sometimes root, butt, or heart rot of living trees. Spp. reported include P. cinnabarinus Jacq. ex Fr., widespread; P. dryophilus Berk. (P. rheades Pers. ex Fr.), Me., Mich.; P. galactinus Berk., N.Y., Oregon; P. gilvus (Schw.) Fr., white sap & heart rot, widespread; P. hirsutus Wulf ex Fr., white spongy sap rot, widespread; P. lacteus Fr., white heart rot, widespread; P. pargamenus Fr., white sap rot, widespread; P. sulphureus Bull. ex Fr., brown butt & heart rot, N.E. States; P. supinus Sw. ex Fr., Southern States; P. tulipiferus (Schw.) Overh., N.E.States; P. versicolor L. ex Fr., white spongy sap rot, widespread.

Poria spp., white spongy rot of dead wood, sometimes root & heart rot of living trees, especially P. ambigua Bres., root rot, Calif., P. prunicola (Murr.) Sacc. & Trott., P. pulchella (Schw.) Cke., P. vaporaria Fr. and P. versipora Pers. ex Romell, chiefly on P. serotina, North Central and Eastern States.

Schizophyllum commune Fr., wood rot, sometimes on living trees. Cosmopolitan.

Sclerotinia spp., brown rot, blossom & twig blight. See Monilinia.

S. sclerotiorum (Lib.) DBy., green rot, shoot blight. Calif.

Septobasidium burtii Lloyd, felt (on branches infested by scale insects). S.Car. to La.

(Septoria cerasina Pk.): Cylindrosporium lutescens Higgins.

S. pruni Ell. and S. purpureocincta Ell. & Ev., leaf spot. On P. americana, Kans.

(Sphaeronema spurium Sacc.): Micropera drupacearum.

Sphaeropsis spp., on twigs. S. peckii Sacc., Kans. & N.Dak.; S. cerasina Pk., N.Y. Conidial stage of Physalospora sp.

Sphaerotheca pannosa (Wallr.) Lev. var. persicae Wor., powdery mildew. N.Y.

Stereum spp., wood rot, sometimes wound or heart rot of living trees. S. hirsutum Willd. ex Fr. widespread; S. rameale Schw., top rot, N.Y., Pa.; S. sericeum Schw., N.Car., W.Va.

S. purpureum Pers., heart rot, silver leaf. N.Y., Pacific Coast States.

PRUNUS -- continued.

Taphrina cerasi (Fckl.) Sadeb., witches'-broom. On P. avium & P. cerasus. Widespread.
T. communis (Sadeb.) Gies., pockets, bladder plums, shoot hypertrophy. On P. americana, P. nigra, and ? other native plums. Widespread.
T. confusa (Atk.) Gies., hypertrophy of fruit, leaf & shoot. On P. virginiana. N. E. States to Wis.
(T. decipiens (Atk.) Gies.): T. communis.
T. farlowii Sadeb., hypertrophy of fruit, leaf & shoot. On P. serotina. N.E.States to Texas.
T. flavorubra Ray, hypertrophy of fruit, leaf & shoot. On P. pumila. N.Y.
T. insititiae (Sadeb.) Johans., witches'-broom. On P. domestica, Eastern States; ? on P. pensylvanica, widespread.
T. longipes (Atk.) Gies., hypertrophy of fruit. On P. americana. Mich., N.Y.
T. mirabilis (Atk.) Gies. (and var. tortilis Atk.), hypertrophy of fruit, leaf & shoot. On P. angustifolia, P. hortulana & P. munsoniana. Central & Southern States.
T. pruni (Fckl.) Tul., pockets. On P. domestica. Widespread.
T. pruni-subcordata (Zeller) Mix, hypertrophy of fruit, leaf & shoot. On P. subcordata. Calif., Oregon.
T. rhizipes (Atk.) Gies., hypertrophy of fruit, leaf & shoot. On P. salicina. Ala.

Trametes hispida Bagl., wound rot, heart rot. Colo., Oregon, Wyo.

Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). General. Two vars. are distinguished: (1) typica (Fisch.) Dunegan, on various native Prunus spp. and occasionally on cult. plums; O and I on Anemone, Hepatica, Ranunculus, Thalictrum etc.; (2) discolor Dunegan, on apricot, peach & cult. plums; O and I on Anemone coronaria.

Valsa cincta Fr. and V. leucostoma Pers. ex Fr. (Cytospora cincta Sacc. and C. leucostoma Sacc.), dieback, twig canker. Widespread.

Verticillium albo-atrum Reinke & Berth., black heart, wilt. On P. armeniaca. Calif.

Virus diseases:

Buckskin, - unidentified virus. On P. avium, Calif.
Crinkle, - unidentified virus, possibly vein-clearing. On P. avium. Oregon, Wash.
Dwarf, - Prunus virus 6 Thomas & Hildebrand (Nanus pruni Holmes). On P. domestica. N.Y.
Line-pattern virosis, - Marmor lineopticum Cation. On P. salicina & P. mahaleb. Calif., Ky., Mich., Ohio; ? on P. americana, Minn.
Little peach, - Prunus virus 1A Smith (chlorogenus persicae var. micropersicae Holmes). On P. munsoniana, P. salicina & P. simonii vars., sometimes masked.
Mosaic, cherry, - unidentified virus. On P. avium, Calif.

PRUNUS -- continued.

Mosaic, peach, -- Prunus virus 5 Hutchins ex Smith (Marmor persicae Holmes). On P. armeniaca, P. domestica, P. salicina & others; sometimes masked. Calif.
Mosaic, Winters peach, - unidentified virus. On P. armeniaca. Calif.
Mottle leaf, - Prunus virus 7 (Marmor cerasi Zeller & Evans) On P. avium. Calif. to Wash. & Idaho.
Rosette, - Prunus virus 2 McClintock ex Smith (Nanus rosettae Holmes). On various Prunus spp. Ga. to Okla. & Kans.
Rusty mottle, - Marmor rubiginosum Reeves. On P. avium. Wash.
Vein-clearing, - Prunus virus 8 (Marmor nerviclarens Zeller & Evans) On P. avium, P. domestica, P. serrulata. Oregon, Wash.
Yellow-red virosis, - Marmor lacerans Holmes. On P. virginiana, Conn. to Ill. On P. virginiana var. demissa, Oregon, Wash.; on var. melanocarpa, Idaho, Utah.
Yellows, peach, - Prunus virus 1 Kunkel ex Smith (Chlorogenus persicae var. typica Holmes). On P. armeniaca and P. salicina & other plums. Eastern States.
Yellows, cherry (yellow leaf), - unidentified virus. On P. cerasus. Mich., N.Y., Wis.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

TEMPERATURE AND PRECIPITATION FOR THE YEAR 1941 AND FOR DECEMBER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the weeks ending January 6 and January 13, 1942).

1941 ANOTHER WARM YEAR: (January 6) Following the general trend since the turn of the century, and especially during the last couple of decades, the year 1941 was warmer than normal in practically all parts of the country. The tendency to above-normal temperature was markedly in evidence in all seasons of the year. The winter was slightly colder than normal in parts of the Atlantic area, but in all other sections above-normal warmth prevailed, the plus departures being especially large in the western half of the country.

The spring season (March-May) had slightly below normal temperatures in the South and most Appalachian Mountain sections, but was substantially warmer than normal throughout the northern half of the country, the largest plus departures, 3° to 5°, appearing from the central Mississippi Valley northward and northwestward.

The summer was somewhat cooler than normal in the Southwest and parts of the Great Basin, also in most of central California; elsewhere it was warmer than normal, with the greatest plus departures in the same area as in the spring. The fall season (September-November) had less than normal warmth in most areas west of the Rocky Mountains, but in all other

sections the seasonal means were above normal, substantially so in most areas.

In January the lowest temperature recorded was -43° at Taylor Park, Colo., and in Alaska, -65° at Fort Yukon. The United States lowest in February was -40° at Edmore, North Dakota, and in Alaska, -42°, again at Fort Yukon. As late as March 10, a temperature of -56° was reported from Allakaket, Alaska.

The highest temperature recorded for the year was 124° at two stations in California, Cow Creek and Greenland Ranch, both in Inyo County. These stations are in the vicinity of Death Valley. The highest reported from Alaska was 91° at Circle Hot Springs.

Figure 1 (A) shows that for the year, as a whole, a very limited area in the interior of the Northeast had slightly below normal temperature. Elsewhere the yearly averages were above normal, with the largest plus departures in the north-central portion of the country from the Ohio and middle Mississippi Valleys northward and northwestward where the annual means were from 2° to nearly 5° in excess of normal.

PRECIPITATION FOR THE YEAR 1941: (January 13) In addition to being a year of abnormal warmth, 1941 was outstanding for heavy precipitation. The last half of the year was especially wet nearly everywhere west of the Mississippi River. Oklahoma, Kansas, New Mexico, Utah, Nevada, and California all had more than one and one-half times the normal rainfall for this 6-month period. The only States having deficiencies were those from North Carolina and Tennessee northward and most of these had nearly normal precipitation.

An outstanding feature of the year's precipitation was the abnormally heavy falls over the western two-thirds of the country; Figure 2(A) shows 5 southwestern States with more than 150 percent of the normal annual amounts. West of the Mississippi River only Arkansas and Washington had deficiencies, and these were small. On the other hand, the Middle Atlantic States, especially Virginia, were abnormally dry.

It was the wettest year of record in North Dakota, Utah, and New Mexico, the last named having about a third more precipitation than is of record for any previous year. It was the second wettest year of record in Nevada, Arizona, Texas, Oklahoma, and Kansas, and the third wettest in California. On the other hand, for the rather limited dry eastern area, Tennessee had the driest year of record, Kentucky, Virginia, and Maryland-Delaware the second driest, and North Carolina the third. For the country, as a whole, the average 1941 annual precipitation was 32.36 inches, or nearly 12 percent above normal. There have been only 2 wetter years in the climatological history of the United States, 1905 with a country-wide average of 32.69, and 1915 with 32.74.

Interesting aspects of the year's precipitation were the heavy amounts in western areas, where the 1930 decade was so dry and dusty, and a reversal, with regards to normal conditions, for the midwest and the more humid eastern sections. For example, Kansas had more precipitation than either of the Virginias, Maryland, Ohio, Indiana, Kentucky, and even Tennessee.

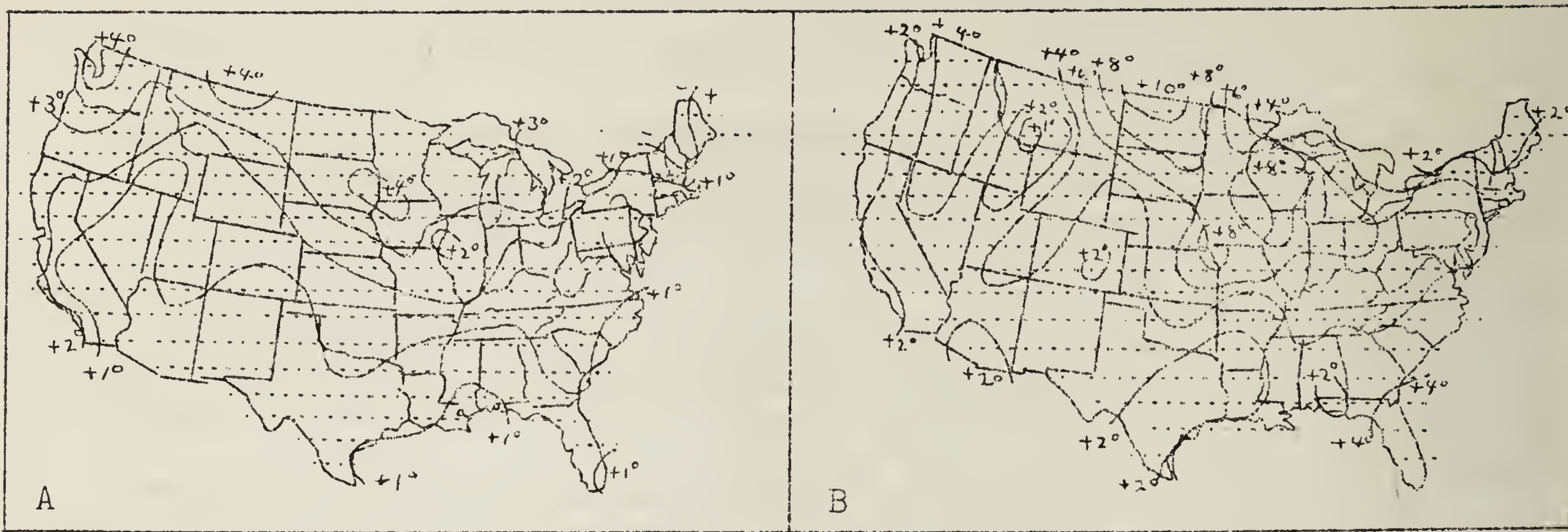

Fig. 1. - Departure from the normal temperature for the year 1941 (A), and for December 1941 (B).
Shaded: Above normal.

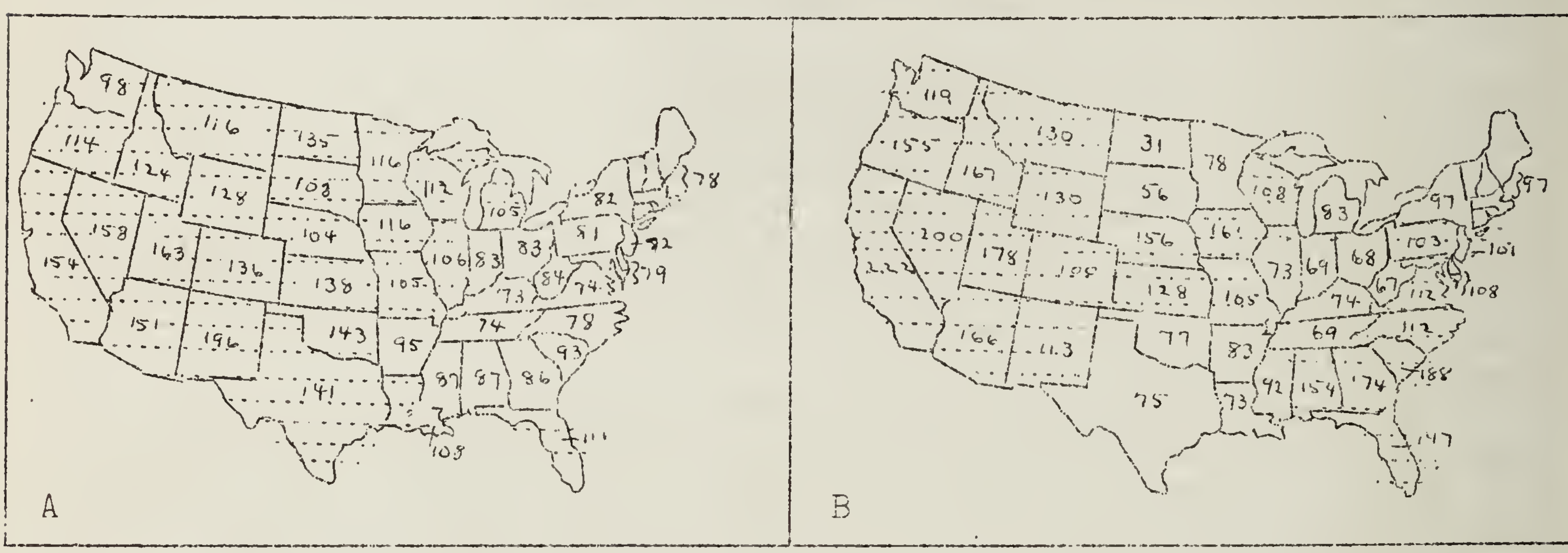

Fig. 2. - Percentage of normal precipitation by States, for the year 1941 (A), and for December 1941 (B).
Shaded: Normal or above.

DECEMBER TEMPERATURES: (January 6) Temperatures in the United States in December, the final month of 1941, were in keeping with the general tendency for the preceding months of the year, in that the means were above normal in practically all sections of the country. For the month, as a whole, a few scattered stations had approximately normal warmth, but in nearly all sections the means ranged from 2° to about 10° above normal, see Figure 1 (B). The extreme Northeast, the Southern States, and Pacific coast districts had the smallest plus departures, mostly 2° or 3°, and the area from the Ohio and central Mississippi Valleys and southern Great Plains northward the largest, generally 5° to 11°.

The average monthly temperatures for December 1941 were quite similar to those for December 1940, except they were considerably higher in central-northern sections, including Michigan, the upper Mississippi Valley, and most of the northern Plains where December 1941 was mostly from 4° to 6°

warmer than December 1940. Also, in a considerable southwestern area, extending from western Texas to the Pacific coast, the means were generally 2° or 3° lower than last year. Elsewhere they were substantially the same.

DECEMBER PRECIPITATION: (January 13) Figure 2 (B) shows that December 1941, was abnormally wet in the Southeastern States, the central trans-Mississippi area, and everywhere west of the Rocky Mountains. In the Southeast, South Carolina and Georgia show the relatively greatest excesses; in the Midwest, Iowa and Nebraska, and in the far West, California and Nevada, much of the last two having more than twice the normal. A central-northern area, centering in North Dakota, was extremely dry, and all States, in general, from Louisiana and Texas northeastward to the Lake Region and New England had less than normal precipitation. California, with an average State rainfall of 8.14 inches, had an unusually wet December, the month being among the wettest of record for the State. Georgia had the third wettest of record.

THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

T H E   P L A N T   D I S E A S E   R E P O R T E R

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

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IN THIS ISSUE

CHECK LIST REVISION

Freeman Weiss

PRUNUS -- continued.

P. ALLEGHENIENSIS, under P. MARITIMA

PRUNUS AMERICANA Marsh., AMERICAN PLUM. Small tree or shrub occurring throughout the U.S. except the Far West and Southwest, cult. for fruit and for ornament, Zone III; also P. NIGRA Ait., CANADA PLUM, in the Great Lakes and Northeastern States, cult. Zone II.

Cercospora circumscissa Sacc., leaf spot. Ill., Nebr., N.Dak.
  C. prunicola Ell. & Ev., leaf spot. Ala., La.
Cladosporium carpophilum Thüm., scab. Widespread.
Coccomyces prunophorae Higgins, leaf spot. Ind.
Coryneum carpophilum (Lév.) Jauch, shoot blight. Oregon.
Diaporthe prunicola (Pk.) Weh., twig canker. Iowa, Nebr.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Widespread.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Wis.
Fomes fulvus (Scop. ex Fr.) Gill., brown heart rot. Widespread.
  F. igniarius (L. ex Fr.) Kickx, heart rot. Mo.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck (on fruit). Ill.
Monilinia fructicola (Wint.) Honey, blossom blight, brown rot. General.
Phyllosticta circumscissa Cke., leaf spot. Calif., Ill.
  P. virginiana (Ell. & Hals.) Seaver. Iowa, Kans.
Phytomonas pruni (EFS.) Bergey, bacterial leaf spot. Mo., N.Car., Ohio.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Widespread.
(Sclerotinia fructicola (Wint.) Rehm): Monilinia fructicola.
Septoria pruni Ell., leaf spot. Kans., Ky., Nebr., N.Dak.
  S. purpureocincta Ell. & Ev. Kans.
Taphrina communis (Sadeb.) Gies, pockets (bladder) of fruit; also (as T. decipiens (Atk.) Gies.) hypertrophy of leaves & shoots. Widespread.
  T. longipes (Atk.) Gies., pockets. Mich., N.Y.
  T. mirabilis (Atk.) Gies., hypertrophy of buds & shoots. N.Car. to Miss., Ill., Iowa, Wis.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Widespread, especially in the South. (Only the var. typica (Fisch.) Dunegan definitely identified.)
Mosaic, -- undet. virus. Minn.

PRUNUS ANGUSTIFOLIA Marsh., under P. MUNSONIANA.

PRUNUS ARMENIACA L., APRICOT. Tree of W. Asia, cult. Zone V, chiefly Calif. Also P. MUME (Sieb.) Sieb. & Zucc., JAPANESE APRICOT, cult. in the Far South.

Alternaria sp., blossom end rot, fruit spot. Calif.

PRUNUS -- continued.

Armillaria mellea Vahl ex Fr., root rot. Calif., Texas.
Botrytis cinerea Pers., green fruit rot (secondary), gummosis. Calif.
Cercospora circumscissa Sacc., leaf spot. Texas.
Cladosporium carpophilum Thüm., scab, freckle (on fruit), twig canker. Widespread.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Coccomyces sp. (Cylindrosporium padi auth.), leaf spot. Calif., Mass., Texas, Vt.
Coryneum carpophilum (Lév.) Jauch, shoot blight, fruit spot. Widespread.
Cytospora spp. (especially C. leucostoma Sacc.), dieback, twig canker, or secondary. Ariz., N.Y. (Conidial stage of Valsa sp.)
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Colo., N.Y.
Diplodia sp. (? D. natalensis Pole-Evans), on twigs. Calif.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Colo., Fla., Nebr., Pa., Texas.
Heterodera marioni (Cornu) Goodey, root knot. Ariz., Texas.
Monilinia fructicola (Wint.) Honey, brown rot usually of ripe fruit, sometimes blossom blight. Widespread, but less common on this host in the Pacific Coast States than the following.
M. laxa (Aderh. & Ruhl.) Honey, blossom & twig blight, brown rot of green & ripe fruit. Pacific Coast States.
Monochaetia rosenwaldia Khazanoff, trunk & limb gall. Calif.
Nectria cinnabarina Tode ex Fr., coral spot, die back. Ind., Wash.
Phyllosticta circumscissa Cke., leaf spot. Calif.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Okla., Texas.
Phytomonas pruni (EFS.) Bergey, bacterial leaf spot, black spot. Ill. to Texas and Nebr.
P. syringae (van Hall) Bergey, bacterial canker, gummosis. Calif., Oregon.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Widespread. (P. mume is resistant).
Phytophthora cactorum (Leb. & Cohn) Schroet. and P. citrophthora (R.E. & E.H. Smith) Leonian, trunk canker. Calif.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Calif., Iowa.
Schizophyllum commune Fr., heart rot, usually following freezing injury. Texas, Wash.
Sclerotinia sclerotiorum (Lib.) DBy., green fruit rot, twig blight. Calif.
Septobasidium pseudopedicellatum Burt, on scale insects infesting bark. Miss.
Sphaerotheca pannosa (Wallr.) Lév. var. persicae Wor., powdery mildew. N.Y.
Stereum purpureum Pers., silver leaf. Calif.
Taphrina (? deformans (Berk.) Tul.), leaf curl. S.Car.
Trametes hispida Bagl., heart rot. Colo.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Calif., Miss., N.Mex., Texas. Both discolor and typica vars. reported.

PRUNUS -- continued.

Valsa leucostoma Pers. ex Fr., die back, twig canker. Mo., Texas.
Venturia (? cerasi Aderh.), fruit spot. Ky.
Verticillium albo-atrum Reinke & Berth., black heart, wilt. Calif.
Physiological diseases.
Arsenical injury. Calif.
Chlorosis, -- alkali injury, mineral deficiency. Ariz., Calif., Texas.
Exanthema, -- copper deficiency. Calif.
Gummosis ("sour sap"), -- adverse soil & moisture relations; sometimes infection by Phytomonas syringae. Ariz., Calif., N.J., Wash.
Little leaf, -- mineral deficiency ?zinc. Calif.
Mottle leaf, -- manganese deficiency. Calif.
Virus diseases.
Mosaic, undet. virus. Calif., Colo., Wash.
Ring spot, undet. virus, possibly same as preceding. Wash.
Winters peach mosaic, undet. virus. Calif.
Yellows, Prunus virus 1 Kunkel ex Smith (Chlorogenus persicae var. vulgaris Holmes). Occasional in Eastern States.
Susceptibility experimentally demonstrated to peach rosette (Prunus virus 2 McClintock ex Smith, Nanus rosettae Holmes), and to peach mosaic (Prunus virus 5 Hutchins ex Smith, Marmor persicae Holmes).

PRUNUS AVIUM L., SWEET CHERRY. Tree of Europe and W. Asia, cult. in numerous hort. vars. in Zone III; also the primitive form known as Mazzard naturalized in Growth Regions 27 & 28 and used as an understock. P. MAHALEB L., MAHALEB CHERRY, also used as an understock, is included.

Alternaria sp., fruit rot. Calif., Idaho, Mich.
A. citri Ell. & Pierce var. cerasi Rudolph, leaf spot. Calif.
Armillaria mellea Vahl ex Fr., root rot. Okla., Oregon.
Botrytis cinerea Pers., gray mold rot. Calif.
Cercospora circumscissa Sacc., leaf spot. Ohio, N.J., Pa., Texas.
Cladosporium sp., fruit rot. Calif. to Wash. & Idaho.
Coccomyces hiemalis Higgins, leaf blight, shot-hole. General.
Coryneum carpophilum (Lév.) Jauch, shoot blight, shot-hole. Idaho, Oregon, Wash.
Dermatea cerasi Pers. ex Fr., on twigs. Alaska, Oregon.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Del. to Mich. & N.Car.
Erwinia amylovora (Burr.) Winslow et al., fire blight (chiefly on fruit). Oregon, Wash.
Monilinia fructicola (Wint.) Honey, brown rot, blossom blight. General.
M. laxa Aderh. & Ruhl., blossom & twig blight, brown rot. Oregon, Wash.
Mycosphaerella cerasella Aderh., leaf spot. Ga. to Fla. & Miss.
Phyllosticta pruni-avium Allesch., leaf spot. Oregon.
Phytomonas pruni (EFS.) Bergey, bacterial spot, black spot, canker. N.Y. to Mich., Ga. and Texas.

PRUNUS -- continued.

P. syringae (van Hall) Bergey, bacterial canker, gummosis. Mass. to Mich. & Mo., Pacific Coast States.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Calif., Texas.
Phytophthora cactorum (Leb. & Cohn) Schroet. and P. citrophthora (R. E. & E.H. Smith) Leonian, collar & trunk canker. Calif.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Occasional.
Polyporus spp. (P. hirsutus Wulf. ex Fr., P. lacteus Fr. and P. versicolor L. ex Fr.), heart rot. Oregon.
Poria ambigua Bres., root & butt rot. Calif.
Septobasidium retiforme Couch, felt. Ga.
Taphrina cerasi (Fckl.) Sadeb., witches'-broom. N.Y., Pa., Texas, Pacific Northwest.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). N.Y., Okla.
Physiological diseases.
Chlorosis, -- alkali injury. Calif., Texas.
Virus diseases.
Buckskin, undet. virus, possibly Marmor lacerans Holmes of peach yellow-red virosis. (P. mahaleb is resistant.)
Crinkle, undet. virus (possibly identical with vein-clearing). Idaho, Wash.
Mosaic, undet. virus. Calif.
Mottle-leaf, Prunus virus 7 (Marmor cerasae) Zeller & Evans. Idaho, Oregon, Wash., ? Calif.
Rusty mottle, Marmor rubiginosum Reeves. Wash.
Vein-clearing, Prunus virus 8 (Marmor nerviclarens) Zeller & Evans. Oregon, Wash., ? Calif. Resembles crinkle (? virus) and "unproductive type" reported in Wash. & Calif. respectively.
Susceptibility experimentally demonstrated to almond calico (undet. virus), peach rosette (Prunus virus 2 McClintock ex Smith, Nanus rosettae Holmes), and to Winters peach mosaic (undet. virus).

PRUNUS BESSEYI Bailey, under P. PUMILA
PRUNUS CAROLINIANA Ait., under P. LAUROCERASUS
PRUNUS CERASIFERA Ehrh., under P. DOMESTICA

PRUNUS CERASUS L., SOUR CHERRY, including var. AUSTERA L., MORELLO CHERRY. Tree of S.E. Europe and W. Asia, cult. for fruit and for ornament in numerous vars. Zone III, also naturalized in Growth Regions 22, 25, 27.

Alternaria sp., fruit rot. Mich.
Botrytis cinerea Pers., gray mold of fruit. Occasional.
Cercospora circumscissa Sacc., leaf spot. N.J., Texas.
Cladosporium carpophilum Thüm., scab, fruit-crack. Iowa, N.J., N.Y.
Coccomyces hiemalis Higgins (Cylindrosporium hiemalis Higgins), leaf spot, shot-hole. General.
Coryneum carpophilum (Lév.) Jauch, leaf blight. Calif., Wash.

PRUNUS -- continued.

Dermatea cerasi Pers. ex Fr., on branches. N.J., N.Y.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Eastern States.
Glomerella cingulata (Ston.) Spauld. & Schrenk, fruit rot. Ind.
Heterodera marioni (Cornu) Goodey, root knot. Md.
Monilinia fructicola (Wint.) Honey, brown rot. General.
M. laxa (Aderh. & Ruhl.) Honey, blossom blight, brown rot. Oregon, Wash.
Mycosphaerella cerasella Aderh. (Cercospora cerasella Sacc.), leaf spot. Va. to Fla. & Miss.
Pestalotia (Pestalozzia) adusta Ell. & Ev., on leaves (secondary). N.Y.
Phomopsis padina (Sacc. & Roum.) Died., canker, twig blight. N.Y., Pa. (Conidial stage of Diaporthe decorticans (Lib.) Sacc. & Roum.)
Phyllosticta circumscissa Cke., leaf spot. N.J.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Phytomonas pruni (EFS.) Bergey, bacterial leaf spot, black spot. N.Y. to Mo. & Iowa.
P. syringae (van Hall) Bergey, bacterial gummosis. Colo., N.Y., Oregon, Wash.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Calif., Wash.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. General.
Stereum purpureum Pers., silver leaf. N.Y.
Taphrina cerasi (Fckl.) Sadeb., witches'-broom. Me. to N.J. and Minn.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). N.Car.
Xylaria sp., root rot. Tenn.
Physiological diseases.
Brown bark spot, -- cause unknown, arsenical poisoning ?. Idaho, Mont., Wash.
Virus diseases.
Mosaic, undet. virus. Calif.
Pink fruit (bitter fruit), virus ?, possibly identical with buckskin disease of sweet cherry. Idaho, Wash.
Yellows (yellow leaf, leaf drop), undet. virus. Mich., N.Y., Wis.
Susceptibility to viruses of buckskin and mottle leaf of sweet cherry, and of peach rosette also demonstrated.

PRUNUS COMMUNIS. See AMYDALUS COMMUNIS
(PRUNUS DEMISSA (Nutt.) Walp.): P. VIRGINIANA var. DEMISSA

PRUNUS DOMESTICA L., GARDEN PLUM. Tree of Europe and W. Asia, cult. for fruit in many forms, Zone IV; including P. INSITITIA L., DAMSON, and P. SPINOSA L., BLACKTHORN or SLOE, cult. in same range and also locally naturalized in the East. Other garden plums included here are: P. SALICINA Lindl., JAPANESE PLUM, cult. for fruit in Zone III; P. CERASIFERA Ehrh., MYROBALAN PLUM, grown chiefly as an understock; and P. C. var. ATROPURPUREA Jaeg. PURPLELEAF PLUM, grown for ornament, Zone III.

PRUNUS -- continued.

Alternaria sp., green mold of fruit. Oregon.
Armillaria mellea Vahl ex Fr., root rot. Widespread.
Botrytis cinerea Pers., gray mold of fruit. Calif., Wash.
Cercospora circumscissa Sacc., leaf spot. Calif., Fla., Mass., Texas, Wash.
Cladosporium sp., green mold of fruit. Idaho, Oregon.
C. carpophilum Thüm., scab. Widespread.
Coccomyces prunophorae Higgins (Cylindrosporium prunophorae Higgins) leaf spot, shot-hole. Widespread.
Coryneum carpophilum (Lév.) Jauch, leaf blight, shot-hole. Calif. to Idaho & Wash.
Dermatea cerasi Pers. ex Fr., on branches. N.Y.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Widespread, except in far West.
Diplodia spp. (D. pruni Fckl., D. vulgaris Lév. and others), twig blight (secondary). Fla, N.J. Conidial stage of Physalospora, probably P. obtusa.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Occasional.
Fomes applanatus (Pers. ex Fr.) Gill., collar & root rot, white mottled heart rot. Oregon.
F. fulvus (Scop. ex Fr.) Gill., brown heart rot. Widespread.
F. pinicola (Sw. ex Fr.) Cke. and F. subroseus (Weir) Overh., brown pocket rot. Pacific Northwest.
Heterodera marioni (Cornu) Goodey, root knot. Fla.
Lenzites sepiaria Wulf. ex Fr., brown heart rot. Pacific Northwest.
Monilinia fructicola (Wint.) Honey, brown rot, blossom blight. General.
M. laxa (Aderh. & Ruhl.) Honey, blossom & twig blight, brown rot. Calif., Oregon, Wash.
Phyllosticta circumscissa Cke., leaf spot. Iowa, Wash.
P. congesta Heald & Wolf, blotch (fruit, leaves & twigs). Ga., Texas. (On P. salicina; said to be a Phyllostictina, conidial stage of a Guignardia.)
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Phytomonas pruni (EFS.) Bergey, bacterial spot, blackspot. Eastern & Southern States to Wis. & Texas.
P. syringae (van Hall) Bergey, gummosis, shoot blight. Calif., Oreg.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Widespread.
Phytophthora cactorum (Leb. & Cohn) Schroet., bark canker. Calif., Ind.
Podosphaera oxyacanthae (DC.) DBy. and var. tridactyla (Wallr.) Salm., powdery mildew. Occasional.
Polyporus hirsutus Wulf. ex Fr. and P. versicolor L. ex Fr., white pocket heart rot. Widespread.
Stereum purpureum Pers., silver leaf, heart rot. Wash.
Taphrina spp., leaf curl, witches'-broom. Occasional. (Spp. reported include T. decipiens (Atk.) Gies., T. deformans (Berk.) Tul., T. insititiae (Sadeb.) Johans., T. mirabilis (Atk.) Gies, but with inconclusive determinations.)
T. pruni (Fckl.) Tul., pockets. Widespread.

PRUNUS -- continued.

Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Widespread, especially in the Southern and Pacific Coast States. (Both discolor and typica vars. are recorded.)
Valsa leucostoma Pers. ex Fr., die back, canker. Widespread.
Verticillium albo-atrum Reinke & Berth., black heart, seedling wilt. Calif.
Physiological diseases.
Brown bark spot, -- cause unknown, ? arsenical poisoning. Mont.
Chlorosis, -- mineral deficiency, alkaline soil. Calif., Idaho.
Exanthema, -- copper deficiency. Calif., Fla.
Gum spot (drought spot), -- irregularity of moisture supply. N.Y., Pacific Northwest.
Virus diseases.
Diamond canker, undet. virus. Calif. Limited to Agen var. of P. domestica.
Line pattern virosis (Marmor lineopticum Cation). Mich., Ohio, ? Calif., ? Ky.
Mosaic (? pox), one or more viruses distinguished in part as Prunus virus 1 Thomas & Hildebrand ex Smith on P. domestica in N.Y. & ? Ky., and in part as the preceding virus; also undifferentiated in Calif., Ky., Ill., Minn. and Wash. Symptoms often masked in P. salicina vars.
Vein-clearing, Prunus virus 8 (Marmor nerviclarens) Zeller & Evans. Oregon, Wash.
Yellows, Prunus virus 1 Kunkel ex Smith (Chlorogenus persicae var. typica Holmes). Occasional in Eastern States.
Susceptibility also demonstrated to viruses of little peach (Prunus virus 1 A EFS. ex Smith, Chlorogenus persicae var. micropersica Holmes); peach rosette (Prunus virus 2 McClintock ex Smith, Nanus rosettae Holmes); peach mosaic (Prunus virus 5 Hutchins ex Smith, Marmor persicae Holmes). Symptoms often masked in P. salicina vars.

PRUNUS EMARGINATA (Hook.) Walp., under P. PENSYLVANICA.
PRUNUS GLANDULOSA Thunb., under P. TRILOBA
PRUNUS GRACILIS Engelm. & Gray, under P. MUNSONIANA.
PRUNUS HORTULANA Bailey, under P. MUNSONIANA.
PRUNUS ILICIFOLIA (Nutt.) Walp., under P. LAUROCERASUS
PRUNUS INSITITIA L., under P. DOMESTICA.
PRUNUS JAPONICA Thunb., under P. TRILOBA.

PRUNUS LAUROCERASUS L. (Laurocerasus officinalis Roem.), ENGLISH CHERRY-LAUREL (LAURELCHERRY), and P. LUSITANICA L., PORTUGAL-LAUREL. Evergreen shrubs or small trees of Europe and Asia Minor, cult. for ornament, Zone VI-VII. Also P. CAROLINIANA Ait., CAROLINA CHERRY-LAUREL (LAUREL-CHERRY), of Growth Regions 20, 29, 30; P. ILICIFOLIA (Nutt.) Walp., HOLLYLEAF CHERRY, of G.R.'s 1, 3, 4, 5; and P. LYONI (Eastw.) Sarg., CATALINA CHERRY of G.R. 5.

PRUNUS -- continued.

Alternaria sp., leaf spot. Texas.
Cercospora circumscissa Sacc., leaf spot. Calif.
C. cladosporioides Sacc., leaf spot. La., Texas.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Coccomyces lutescens Higgins, leaf spot. Miss.
Monilinia fructicola (Wint.) Honey and M. laxa (Aderh. & Ruhl.) Honey, blossom blight, brown rot. Calif.
Phyllachora beaumontii (Berk. & Curt.) Cke., leaf spot. Ala.
Phyllosticta laurocerasi Sacc. & Speg., leaf spot. Calif., Fla.
Phytomonas pruni (EFS.) Bergey, bacterial spot. Ga., Miss., N.J., S. Car.
Septoria ravenelii Thüm., leaf spot. S.Car.
Verticillium albo-atrum Reinke & Berth., wilt. Calif.

PRUNUS MARITIMA Marsh. BEACH PLUM. Shrub of coastal areas Me. to Va., sometimes cult. for fruit. Also P. ALLEGHANIENSIS Porter, ALLEGHANY PLUM, of similar range inland; P. UMBELLATA Ell. FLATWOODS PLUM, of coastal areas, N.Car. to Texas; and P. SUBCORDATA Benth., PACIFIC PLUM, KLAMATH PLUM, occurring in Oregon & Calif., sometimes grown for fruit.

Cylindrosporium sp., leaf spot. Fla.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Ala., Mass., N.Y., Oregon.
Monilinia fructicola (Wint.) Honey, brown rot, twig blight. Calif.,Fla.
Phytomonas pruni (EFS.) Bergey, bacterial spot. Fla.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Md., Fla.
Taphrina communis (Sadeb.) Gies. (? T. mirabilis Atk.), pockets. Mass. to Fla.
T. pruni-subcordatae (Zeller) Mix, pockets, witches'-broom. Calif., Oregon. On P. subcordata.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Calif.,Fla.

(PRUNUS MELANOCARPA (Nels.) Rydb.): P. VIRGINIANA var. MELANOCARPA.
PRUNUS MEXICANA S. Wats., under P. MUNSONIANA

PRUNUS MUNSONIANA Wight & Hedr., WILDGOOSE PLUM. Tree of Growth Regions 20, 22, 25, 29; cult. Zone V. Also P. ANGUSTIFOLIA Marsh., CHICKASAW PLUM of G.R.'s 20, 22, 25, 28, 29, 30; P. GRACILIS Engelm. & Gray, OKLAHOMA PLUM of G.R.'s 16, 22, 25; P. HORTULANA Bailey, HORTULAN PLUM of G.R.'s 22, 25, 27, 29; P. MEXICANA Wats., MEXICAN PLUM, of G.R.'s 19, 20, 22, 25, 29, 30.

Cercospora circumscissa Sacc., leaf spot. Kansas.
Cladosporium carpophilum Thüm., scab. Iowa.
Coccomyces prunophorae Higgins (Cylindrosporium prunophorae Higgins), leaf spot. Ark., Ind., Iowa.

PRUNUS -- continued.

Corticium stevensii Burt, thread blight. Fla.
Diaporthe decorticans (Lib.) Sacc. & Roum., canker. Iowa.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Ala., Miss.
Fomes fulvus (Scop. ex Fr.) Cke., brown heart rot. Iowa, Va.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck. Mo.
Monilinia fructicola (Wint.) Honey, brown rot. General.
Phoradendron flavescens (Pursh.) Nutt., mistletoe. Southern States.
Phyllosticta congesta Heald & Wolf, leaf blotch. Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Phytomonas pruni (EFS.) Bergey, bacterial spot. Mo., Ohio.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Md., Nebr.
Taphrina sp. (? T. communis (Sadeb) Gies., ? T. pruni (Fckl.) Tul.), pockets. Ala. to Okla. & Kans., Minn., S.Dak.
T. mirabilis (Atk.) Gies., bud & shoot hypertrophy. N.Y. to Ala., Texas & Iowa. Also var. tortilis Atk., on fruit. Ga., Md.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Central & Southern States. (The var. discolor recorded on P. hortulana and P. mexicana; var. typica on others in this host group.)

PRUNUS NIGRA Ait., under P. AMERICANA.

PRUNUS PENSYLVANICA L.f.* PIN CHERRY. Small tree of Growth Regions 13, 15, 18, 21, 23, 24, 26, 27; also P. EMARGINATA (Dougl.) Walp., BITTER CHERRY, of G.R.'s 1, 2, 4, 6, 8, 9, 10, 11, 12, 13, 14; both sometimes cult. for ornament or food for wildlife.

Armillaria mellea Vahl ex Fr., root rot. Wash.
Cercospora circumscissa Sacc., leaf spot. Wis.
Coccomyces hiemalis Higgins (Cylindrosporium hiemalis Higgins), leaf spot. Widespread. On P. pensylvanica.
C. lutescens Higgins. Mont., Wash. On P. emarginata.
Coryneum carpophilum (Lév.) Jauch, leaf spot. Idaho.
Dermatea cerasi Pers. ex Fr., on branches. Widespread.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Widespread.
Fomes fulvus (Scop. ex Fr.) Gill., brown heart rot. Tenn.
Mycosphaerella nigerristigma Higgins, on leaves. Ga., Miss.
Nectria sp., branch & trunk canker. Vt.
N. cinnabarina Tode ex Fr., coral spot, die back. N.Car., Tenn., Wash.
Phyllosticta congesta Heald & Wolf, leaf spot. Wis.
P. virginiana (Ell. & Hals.) Seaver. Me.
Podosphaera oxyacanthae (DC.) DBy. and var. tridactyla, powdery mildew. Ill., Pa., Wash., Wis.

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* The spelling "pensylvanica" is authentic and is employed by some authorities, but the more natural "pennsylvanica" is favored by others.

PRUNUS -- continued.

Taphrina sp., pockets. N.Dak., Vt., Wash.
T. cerasi (Fckl.) Sadeb., witches'-broom. N.H.
T. flectans Mix, witches'-broom. Calif., Wash. On P. emarginata.
T. insititiae (Sadeb.) Johans., witches'-broom. Me. to Wis., Colo.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Ill., Iowa, Wis.
Mottle leaf, Prunus virus 7 (Marmor cerasi) Zeller & Evans. Oregon, Wash.
Yellows, undet. virus. Wis.

PRUNUS PUMILA L., SAND CHERRY. Shrub of Growth Regions 15, 18, 21, 23, 24, 26, 27, 28. Also P. BESSEYI Bailey, WESTERN SAND CHERRY, in G.R.'s 15, 16, 18, 19, 23; cult. for fruit and hybridized with plums, Zone III.

Cercospora circumscissa Sacc., leaf spot. Del.
Coccomyces hiemalis Higgins, leaf spot. Wis.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. N.Dak., Wis.
Monilinia fructicola (Wint.) Honey, brown rot, twig blight. General.
Phytomonas pruni (EFS.) Bergey, bacterial spot. Iowa, Ohio.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Minn.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. North Central States.
Taphrina communis (Sadeb.) Gies., pockets, leaf curl. N.Y. to Kans. & N.Dak.
T. farlowii Sadeb., pockets. N.Y.
T. flavorubra Ray, pockets, shoot hypertrophy. N.Y. On P. pumila var. susquehanae (Willd.) Jaeg.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Iowa, Kans., Minn., S.Dak., Wis. Both discolor and typica vars. recorded.
Virus diseases.
Susceptibility to yellow-red virosis (Marmor lacerans Holmes) experimentally shown.

PRUNUS SALICINA Lindl., under P. DOMESTICA

PRUNUS SEROTINA Ehrh., BLACK CHERRY. Large tree of Growth Regions 11, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30; cult. for ornament and fruit, Zone III. A few records on the var. SALICIFOLIA (Kunth) Koehne, of Mexico & southward, cult. Zone VI, and on P. PADUS L., EUROPEAN BIRD CHERRY, cult. for ornament in Zone III, are included.

Armillaria mellea Vahl ex Fr., root rot. N.H.
Cercospora circumscissa Sacc., leaf spot. Widespread.
Coccomyces lutescens Higgins (Cylindrosporium lutescens Higgins), leaf spot. Widespread.
Dermatea cerasi Pers. ex Fr., on branches. N.Y.

PRUNUS -- continued.

Diaporthe pennsylvanica (Berk. & Curt.) Weh., on branches. N.Y.
D. pruni Ell. & Ev., twig canker. Iowa, Mass., Mich., N.Y.
D. tuberculosa (Ell.) Sacc. var. pruni Dearn. & House. N.Y.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. Widespread.
Dothichiza serotina Atk., on leaves. Ala., W.Va.
Fomes fomentarius (L. ex Fr.) Kickx and F. pinicola (Sw. ex Fr.) Cke., trunk rot. N.E. States.
Monilinia fructicola (Wint.) Honey, brown rot. Widespread.
M. seaveri (Rehm) Honey (Monilia seaveri Reade), twig blight, seedling blight. Vt. to Ga., Ark. & Iowa.
Mycosphaerella cerasella Aderh., leaf spot. N.Y.
Nectria sp., canker. N.Y.
Pestalotia adusta Ell. & Ev., on leaves. N.Y., Va.
Pezizella oenotherae (Cke. & Ell.) Sacc., on twigs. Va.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Southern States.
Phyllosticta serotina Cke., leaf spot. Widespread.
P. virginiana (Ell. & Hals.) Seaver. Iowa, Kans.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. N.Y. to Mich. & Nebr.
Polyporus spp. (especially P. dryophilus Berk., P. hirsutus Wulf. ex Fr., P. sulphureus Bull. ex Fr. and P. versicolor L. ex Fr., sapwood and heart rot. Widespread.
Stereum rameale Schw., trunk rot. N.Y., Pa.
Taphrina farlowii Sadeb. (T. varia (Atk.) Mix), hypertrophy of fruit, leaves & shoot. Vt. to Fla. & Texas.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Mass. to Ga., Texas & Nebr. Only var. typica recorded.
Valsa leucostoma Pers. ex Fr., twig canker, dieback. Widespread.

PRUNUS SERRULATA Lindl., ORIENTAL CHERRY. Large tree of E. Asia, cult. in many vars. for ornament. Other spp. of flowering cherries included here are P. SARGENTII Rehd., P. SIEBOLDII (Carr.) Wittm., P. SUBHIRTELLA Miq., HIGAN CHERRY, and P. YEDOENSIS Matsum., YOSHINO CHERRY; all of Japan and cult. in numerous vars.

Catenophora pruni Luttrell, on twigs. N.Car.
Cercospora circumscissa Sacc., leaf spot. N.Y.
Cladosporium carpophilum Thüm., scab. Miss.
Coccomyces hiemalis Higgins, leaf spot. Mass., N.J.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Ga., Ohio.
Phytomonas pruni (EFS.) Bergey, bacterial spot. N.Y.
Taphrina cerasi (Fckl.) Sadeb., witches'-broom. Md., N.J.
Vein-clearing, Prunus virus 8 (Marmor nerviclarens) Zeller & Evans. Oregon

PRUNUS SUBCORDATA Benth., under P. MARITIMA.
PRUNUS SUBHIRTELLA Miq., under P. SERRULATA.

PRUNUS -- continued.

PRUNUS TOMENTOSA Thunb., under P. TRILOBA.
(PRUNUS TRIFLORA Roxb.): P. SALICINA

PRUNUS TRILOBA Lindl., FLOWERING ALMOND. Small tree or shrub of China, cult. for ornament, Zone V. Several horticulturally similar ornamental spp. as P. TOMENTOSA Thunb., NANKING CHERRY, and P. GLANDULOSA Thunb., DWARF FLOWERING ALMOND, are included.

Armillaria mellea Vahl ex Fr., root rot. Miss.
Botrytis cinerea Pers., blossom & twig blight. N.Y.
Erwinia amylovora (Burr.) Winslow et al., twig blight. Ind.
Monilinia fructicola (Wint.) Honey, blossom & twig blight, brown rot. Conn., Kans.
Phytomonas pruni (EFS.) Bergey, bacterial spot. N.J.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Iowa.

PRUNUS VIRGINIANA L., COMMON CHOKECHERRY. Shrub or small tree of Growth Regions 21, 22, 23, 24, 25, 26, 27, 28, 29, 30; including the WESTERN CHOKECHERRIES, P. V. var. DEMISSA (Torr. & Gray) Torr. of the Pacific Coast, and var. MELANOCARPA (A. Nels.) Sarg. of the Great Plains and Rocky Mts. States.

Cercospora circumscissa Sacc., shot-hole, leaf spot. N.E. States; N.Dak. to Kans. & Mont.
Coccomyces lutescens Higgins (Cylindrosporium lutescens Higgins), shot-hole, leaf spot. General.
Cylindrosporium nuttallii (Harkn.) Dearn. (? C. lutescens), leaf spot. On P. demissa. Oregon.
Cytospora chrysosperma Pers. ex Fr., on twigs, ? canker. Mont.
Dermatea cerasi Pers. ex Fr., on branches. Mass., N.Dak.
Dibotryon morbosum (Schw.) Theiss. & Syd., black knot. General.
Fomes fulvus (Scop. ex Fr.) Gill., brown heart rot. N. & S. Dakota.
Gloeosporium prunicolum Ell. & Ev., leaf spot. N.Y., Wis.
Heterodera marioni (Cornu) Goodey, root knot.
Lophodermina prunicola Tehon, tar spot. On P. v. var. melanocarpa. Colo.
Melanconium cerasinum Pk., on branches. Kans., N.Dak.
Monilia angustior (Sacc.) Reade, shoot & fruit blight. Vt. to Kans. & N.Dak. Conidial stage of Sclerotinia angustior Reade (= Monilinia padi (Wor.) Honey ?)
Monilinia demissa (Dana) Honey, shoot & fruit blight. On P. demissa. Wash. (Distinction from preceding, especially on P.v. var. melanocarpa in N.Dak., Idaho & Utah, doubtful. Reports of M. fructicola (Wint.) Honey and M. seaveri (Rehm) Honey on these hosts are doubtful.)
Mycosphaerella cerasella Aderh. (Cercospora cerasella Sacc.), leaf spot. Kans.

PRUNUS -- continued.

Myxosporium pruni (Pk.) Dearn. & House, on branches. N.Y.
Nectria cinnabarina Tode ex Fr., on branches, often following black knot. Widespread.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.
Phyllosticta circumscissa Cke., leaf spot. Kans., Wash.
P. serotina Cke. Nebr., Pa., S.Car.
P. virginiana (Ell. & Hals.) F. Tassi, leaf blotch. N.Y. to Kans. & Mont. (Has been reported as P. destruens Desm. and P. prunicola Sacc.)
Physalospora obtusa (Schw.) Cke., on branches. Kans., N.Y.
Phytomonas pruni (EFS.) Bergey, bacterial spot. Ill., N.Y., Mont., Wyo.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Widespread.
(Sclerotinia angustior Reade): ? Monilinia padi
(S. demissa Dana): Monilinia demissa
Septoria pruni Pk., leaf spot. Mich.
Taphrina confusa (Atk.) Gies. (T. unilateralis (Pk.) Mix), hypertrophy of leaf, fruit & shoot. Widespread, including Western States. (Various Taphrina spp. reported on these hosts, including T. cecidimophila (Atk.) Gies, on fruit galls, probably belong here.
Tranzschelia pruni-spinosae (Pers.) Diet., rust (II,III). Conn. to Ill. & Wis.
Valsa cincta Fr. and V. leucostoma Pers. ex Fr., on branches. Kans., Mont., N.Dak.
Yellow-red virosis, Marmor lacerans Holmes. N.H. to Va., Ill. & Wis.; on var. demissa in Oregon, and on var. melanocarpa in Utah & Idaho. (Susceptibility experimentally demonstrated to the cherry buckskin and cherry yellows viruses.)

PRUNUS YEDOENSIS, under P. SERRULATA.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

THE USE OF SPERGON FOR SWEETPOTATO SEED AND SPROUT TREATMENTS[1/]

O. H. Elmer

The present national emergency requires that more foods be produced and that losses from diseases be reduced. From the preliminary results presented it appears that Spergon may prove valuable to this end in connection with the sweetpotato. The 1941 data are presented with full realization that additional information must be obtained before a final decision can be made concerning the value of Spergon for treating sweetpotato seed or sprouts. There probably is no better way to determine

1/ Contribution No. 431, Department of Botany, Kansas Agricultural Experiment Station.

its value quickly than that it be tried by numerous investigators over a wide range of conditions.

Investigations have been in progress in Kansas during past years to find more effective methods for treating seed sweetpotatoes before bedding and for dipping the sprouts before they are set in the field.

The recommended method for seed treatment before the roots are placed in the hotbed has been soaking for 10 minutes in one part corrosive sublimate to 1000 parts of water. The greatest objection to this treatment is the injury that frequently occurs, resulting in fewer sprouts being produced.

Past seasons' sprout treatment investigations indicate clearly that infection of field-borne stem-rot fungus to newly set sprouts can be reduced when the below-ground portions are coated with certain protective fungicides. This method of preventing stem rot and other diseases has, however, not resulted in yield increases in Kansas. Bordeaux mixture and certain other fungicides usually produced injury and yield increases did not result even though stem-rot infection was reduced.

Among the fungicidal materials included in the 1941 sweetpotato seed and sprout treatment tests was Spergon, wettable grade, a fungicide manufactured by Naugatuck Chemical Division of the United States Rubber Company. This material, at a dilution of 2 ounces per gallon of water, was used as a momentary dip for seed and for sprout treatments.

Semesan Bel included in the tests was used at the rate of 2 ounces per gallon of water for seed treatments and at 1 ounce per 5 pints of water for sprout treatments. Both treatments were made as momentary dips. The sprout treatments with Semesan Bel and with Spergon were made in the field shortly before the plants were set.

Corrosive sublimate, used only as a seed treatment, was used at 1 part to 1000 parts of water with a treatment period of 10 minutes.

Results

The results obtained in 1941 indicate that Spergon may be useful as a fungicidal treatment for sweetpotato seed and sprouts. As is shown in the accompanying table, Spergon-treated sweetpotatoes produced a greater number of sprouts than did the untreated controls or the lots treated with corrosive sublimate or Semesan Bel. It appears probable that Spergon produced a stimulatory effect on the treated sweetpotatoes. Disease or decay was not observed in the untreated controls and apparently was not the reason for the lower number of sprouts produced in these lots.

Sweetpotato Seed Treatment - 1941
Number Sprouts Produced
(Little Stem Jersey)

Seed treatment	First Hotbed 1/	Second Hotbed 2/	Total Sprouts
Spergon	1040	695	1735
Semesan Bel	548	561	1109
Corrosive Sublimate	805	183	988
Untreated Check	764	541	1305

1/ Sprouts pulled twice.
2/ Sprouts pulled once.

Sweetpotato Sprout Dip Treatments - 1941
Stem-rot Infection and Yield Data

Sprout dip treatment	Farm 1 1/ No. plants harvested	Percent stem rot	Bu. per A.	Farm 2 2/ Bu. per A.
Spergon	329	7.0	324.2	519.2
Semesan Bel	320	10.9	269.8	465.6
Untreated	253	55.3	198.3	419.1

1/ Nancy Hall. Each plot consisted of duplicated 14-rod rows.
2/ Little Stem Jersey. Each plot consisted of a 10-rod row.

The sprout treatment tests were made in two commercial fields. The soil of Farm 1 was severely infested with the stem-rot fungus as is evident from the data showing that approximately 20 per cent of the untreated plants died prior to harvest time, and that 55.3 percent of the harvested plants were infected. In contrast to this, only 10.9 percent of the Semesan Bel treated plants and 7 percent of the Spergon treated plants became infected with stem rot.

The data presented indicate that both Spergon and Semesan Bel treated sprouts produced considerably higher yields than did the untreated controls in both farm plots. The highest yields were produced following treatment with Spergon.
(KANSAS AGRICULTURAL EXPERIMENT STATION).

OBSERVATIONS ON SOME DISEASES OF TOMATOES AND OTHER VEGETABLES IN SOUTH TEXAS

A. L. Harrison and S. S. Ivanoff

A plant disease survey was made during the week of November 10 to 15 in the following counties of South and Southwest Texas: Frio, Atascosa, Zavala, Maverick, Dimmit, Webb, Zapata, and Hidalgo. Dr. G. H. Godfrey aided in the survey in the Lower Rio Grande Valley. Most of the time was spent inspecting the fall tomato crop which was just coming into production while some records were made on other vegetable crops. The first picking from the tomato fields was light with most varieties, because unusually high temperatures in September and October had caused shedding of most of the blooms. A better yield was forecast for the later pickings.

In general there were fewer fungus and bacterial leaf spots this year on tomatoes than in previous years. On the other hand the virus diseases were widely prevalent particularly in Quemado Valley (Maverick County) and at places in the Lower Rio Grande Valley. The disease that caused the most concern was one to which we tentatively have given the name "rosette."

ROSETTE was observed in every county and in every field inspected. In some cases it was causing serious losses. In one large field of nearly 200 acres near Zapata, from 50 to 90 percent of the plants were affected, resulting in a loss of at least 50 percent of the crop. Severely affected plants bore few or no marketable fruits, while those less severely affected bore some good fruits. Rosette closely resembles the published description of "bunchy top." However, since there is a total absence of external necrotic streaks on the stems and no evidence of mottling or necrosis of the leaves, except in a few cases where it might have been due to some other cause, the disease is considered to be distinct from bunchy top. The name rosette is suggested for the disease since shortening of the internodes and bunching of the foliage are the most conspicuous symptoms. The first visible symptom of the disease is a stunting of the terminal growth with a rapid development of the buds immediately below the growing point. This gives the plant a bunchy appearance. In severe cases the plant becomes a compact mass of leaves and short stems, while in milder cases the plant is more open and normal in appearance. The stems of affected plants tend to become thick and stiff. Plants with mild symptoms are not readily distinguished from normal plants. The foliage of plants affected with rosette is dark green in color. The leaves may be twisted and deformed and somewhat reduced in size, especially on badly affected plants that had probably taken the disease at an early stage. A symptom that has been more or less constantly associated with the rosette disease is an internal necrosis, usually at the nodes. These necrotic spots (which at first begin as watersoaked areas in the pith tissue) are rarely visible from the outside, though sometimes they can be seen by transmitted light as a dark green spot on the stem. By cutting the stem a brown to black spot may be seen in the pith. Frequently there is a depressed area on the side of the stem near the necrotic spot which may develop into a short crack or canker, usually not over 1-2 cm. in length and frequently much shorter. These internal necrotic spots probably are not definite diagnostic symptoms of rosette since they have been found on plants in the greenhouse that otherwise appear normal. At no time has a plant been found with rosette that had external necrotic spots or streaks of the stems and leaves as in the case of typical bunchy top. The cause of rosette is not known.

SPOTTED WILT was found on a few plants in Webb, Dimmit, Maverick, Zavala, and Atascosa Counties.

FRUIT POX was observed in several fields, but it was not causing much concern.

MOSAIC (common). Several fields in the lower Rio Grande Valley were suffering severely from mosaic, with from 80 to 100 percent of the plants affected. Mosaic was not serious in the other areas visited.

WITCHES BROOM was found on a few plants in Hidalgo, Zapata, and Maverick Counties.

"YELLOW TOP." This condition, which was first observed[1] in several fields in 1937, was found in Hidalgo, Zapata, Webb, and Maverick

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1/ Young, P.A., Altstatt, G.E., and Harrison, A.L. Plant disease survey in Southwest Texas. Plant Disease Reporter 22:6-12. 1938.

Counties. In a few fields a high percentage of the plants were affected, while in others only occasional diseased plants were found. The cause of this disease has not been determined.

CURLY TOP. A few plants affected with curly top were found in several fields in Webb County and also in one field each in Hidalgo and Atascosa Counties.

BACTERIAL SPOT (Phytomonas vesicatoria) was severe in some fields in Maverick and Dimmit Counties. A few affected fruits were found in Hidalgo, Zapata, and Zavala Counties. However, bacterial spot was not causing much concern.

EARLY BLIGHT (Alternaria solani) was found on a few leaves in most of the fields inspected, but it was causing no noticeable loss, except in one field in Hidalgo County.

TOMATO WILT (Fusarium lycopersici) caused at least 80 percent damage in 10 acres of one large field in Webb County. Losses from a trace to 5 percent were found in several fields in Hidalgo and in one field in Atascosa County.

SOUTHERN BLIGHT (Sclerotium rolfsii) destroyed at least 45 percent of the plants in one field in Atascosa County. It was found also on a few plants in scattered fields throughout the region.

BLOSSOM END ROT and PUFF together with PHYTOPHTHORA AND RHIZOCTONIA SOIL ROTS were observed on a few fruits, but in no case were they causing appreciable damage.

ROOT KNOT (Heterodera marioni). Portions of several large fields near Laredo in Webb County were suffering severely from root knot. Root knot was found also in a few fields in Maverick County.

SHOULDER BLOTCH. A tomato fruit trouble apparently of non-parasitic origin, resembling bruises on the "shoulder" of the fruit near the stem end, was prevalent in the Winter Garden region and had caused serious losses shortly before this survey was made. This trouble has been under observation and study by the junior author for two years and a more detailed description with illustrations of this fruit abnormality will appear later.

DISEASES OF OTHER CROPS.

Beans. Common mosaic was general in several fields in Atascosa, Zapata, and Hidalgo Counties, and causing some reduction in quality and yields of beans. One large field in Zapata County was suffering severely from a root rot the cause of which was not determined.

Squash. Mosaic was affecting from 50 to 100 percent of the plants interplanted in a 50-acre tomato field in Zapata County. The crop of squash was almost a total failure. No mosaic was found on the tomato vines in the same field. Mosaic was found to be affecting about 5 percent of the plants in a field in Hidalgo County.

Potato. Traces of black leg, tip burn, and Fusarium wilt were found in one field in Hidalgo County.

Peppers. Southern blight (Sclerotium rolfsii) was causing appreciable losses in Maverick, Frio, and Zavala Counties, where as much as 50 percent of the crop in some fields had been taken by this disease. Traces of southern blight were also found in fields in Zapata County. Mosaic was present in several of the fields inspected and in one large

field in Zavala County nearly all of the plants were affected, while in most fields the disease affected from 5 to 20 percent of the plants.

Eggplants. "Yellows" (virus) was not so prevalent as in other years. This is probably due to the fact that the disease is easily controlled by dusting with sulphur. However, from 80 to 100 percent of the plants were affected in occasional fields in Frio and Dimmit Counties. Southern blight was observed on 5 to 10 percent of the plants in one field in Frio County.

Cowpeas. Approximately 30 percent of the plants were destroyed by mosaic (apparently a strain of cucumber mosaic) in one field in Frio County.

Spinach. Scattered cases of downy mildew [*Peronospora effusa*] and traces of curly top were found. White rust [*Albugo occidentalis*] had not yet made its appearance.
(TEXAS AGRICULTURAL EXPERIMENT STATION, YOAKUM AND WINTER HAVEN).

OCCURRENCE OF TOMATO LEAF MOLD AND OF MUSKMELON POWDERY MILDEW IN THE FIELD IN NEW HAMPSHIRE

R. W. Barratt

The presence of leaf mold (*Cladosporium fulvum*) on tomatoes in the variety trials and breeding blocks at the University of New Hampshire Horticulture Farm was first observed on August 8. This infection rapidly spread throughout the field and by September 1 had caused serious damage. The organism is believed to have been carried out into the field on greenhouse grown seedlings. It was also reported by home gardeners in the vicinity who had obtained their plants from the greenhouse. Although a serious disease in Durham, it was not found elsewhere in the State.

During the summer of 1941, powdery mildew (*Erysiphe cichoracearum*) seriously damaged the breeding block at the Horticulture Farm at Durham. The organism was first seen in one corner of the field about the middle of August. By September 1 the entire field had been killed by the mildew. It is believed that the organism may have been carried into the field from the greenhouse where it is always present. It has not been found in any other portion of the State.
(NEW HAMPSHIRE AGRICULTURAL EXPERIMENT STATION).

DOWNY MILDEW ON SOYBEAN SEEDS

H. W. Johnson and C. L. Lefebvre

Seeds of the 1941 crop of Mammoth Yellow soybeans were received recently with a request for information as to the cause of their milky appearance and cracked skins. Examination revealed that the whitish crust on the wrinkled and cracked seed coats was a solid mass of downy mildew oöspores. In unstained mounts the oöspores were globose, almost

hyaline, ranged from 23 to 32 microns in diameter and had a smooth wall approximately 3 microns thick. In mounts stained with cotton blue in lacto-phenol, the epispore was in some cases irregularly reticulate. When the reticulations of the epispore were included, the oöspores were 3 to 9 microns larger than the measurements given above. No conidiophores or conidia were found in mounts from the seeds. It would appear from the oöspore characters that the downy mildew on the seeds is Peronospora manshurica (Naoumoff) Sydow. Previous reports of soybean downy mildew in this country have considered it to be strictly a foliage disease, although there are reports that the disease is seed-borne. It appears from this material, however, that downy mildew may be of economic importance on some varieties and in some years at least, because of injury to the soybean seed crop.
(DIVISION OF FORAGE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, WASHINGTO D. C.)

CHARCOAL ROT OF CORN AND SORGHUM IN NEBRASKA

J. E. Livingston

The sorghum acreage in Nebraska increased from 515,000 acres in 1937 to 1,942,000 acres in 1941 of which 736,000 acres were grain sorghum. Obviously with this increase in the acreage of sorghum there has been an increase in the importance of diseases of sorghum.

In September 1940, charcoal rot caused by Rhizoctonia bataticola (Taub.) Butl. was observed in the experimental sorghum plots at Lincoln. In order to obtain some idea of the severity of the disease, a limited survey of the southeastern one-fourth of Nebraska was made during October 1940. Charcoal rot was found in 71 percent of the grain sorghum fields. In some of the fields 60 percent of the heads were lying on the ground from stalk breaking. The sclerotia of the fungus were found in infected samples from all of the fields showing the disease. The disease was not found in the forage sorghums. Since it is difficult to identify charcoal rot until the plants are approaching maturity, there was a question whether the forage sorghums were actually less susceptible than the grain sorghums or were not sufficiently mature to show the disease. However, during the past two years very little charcoal rot has been observed in forage sorghums.

Observations were not made on corn in 1940. In 1941 a State-wide survey was made and charcoal rot was found in corn in all parts of the State except the Panhandle region in the west. Seventy-four percent of the fields were infected, with from a trace to 95 percent of the stalks diseased. In many of the fields 30 to 40 percent of the stalks were infected. There appeared to be a difference in the susceptibility of corn varieties and hybrids in the test plots scattered throughout the State. Owing to differences in maturity of the varieties and hybrids, however, a direct comparison on the basis of the data obtained on the survey cannot be made.

Charcoal rot was present in 18 percent of the grain sorghum fields with one field of Colby milo in Clay County showing about 85 percent of the plants infected. In general the infection varied from 1 to 25 percent of the plants. The infected fields of sorghum were located principally in the eastern third of the State.

The disease appeared in corn fields located on many different soil types from the heavy clay soils in eastern Nebraska to the sandy soils of northern Lincoln County. It was more prevalent in eastern and central Nebraska than in the western part of the State. It appeared to be more damaging in dry-land areas or under drouth conditions than in wetter regions or under irrigation.

Sclerotia of Rhizoctonia bataticola were found in corn in all regions of the State except the Panhandle. The organism was isolated from irrigated corn near Scottsbluff. This corn showed a brownish rot at the base of the stalk. A limited number of plants were found in scattered fields throughout the Panhandle showing this basal rot but no sclerotia were present. This indicates that the disease was present in very small amounts in the Panhandle, but apparently the environmental conditions there did not favor the development of the disease and the formation of sclerotia.

Only the most susceptible varieties of grain sorghum showed sclerotia at the time of the survey. Many fields of Early Kalo grain sorghum showed rotting and shredding of the basal portion of the stalk but no sclerotia could be found.

In view of the manner in which charcoal rot developed in the experimental plots in Lincoln during August 1941, weather conditions apparently did not favor the development of the disease in grain sorghums in eastern Nebraska to the extent that it did in 1940. In 1940 the disease continued to develop up until harvest time with serious lodging in many of the grain sorghum varieties. In 1941 charcoal rot was present in the April 15 to 20 plantings of Early Kalo and Sooner with abundant sclerotia forming by the latter part of July. Fall rains began on September 2 and sclerotial development ceased in all except one or two of the most susceptible varieties, such as Colby milo. It even became increasingly difficult to find plants showing sclerotia in the planting of Early Kalo and Sooner where such plants had been abundant in late July. It was suspected that the moist conditions were largely responsible for this.

Precipitation was higher throughout eastern and southern Nebraska in 1941 than in 1940, especially during September and October. Temperatures, on the other hand, were lower except during August. Experimental data on the effect of temperature and moisture on charcoal rot of corn and sorghum are not available. Kendrick (1), Tompkins (2), and Tompkins and Gardner (3) found charcoal rot of beans, cowpeas, and sugar beets to be favored by high temperatures. In accordance with these results, field observations indicate that high temperatures also favor the development of the disease in sorghum. There are also indications that low moisture favors the disease.

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3. ______________, and M. W. Gardner. Relation of temperature to infection of bean and cowpea seedlings by Rhizoctonia bataticola. Hilgardia (Calif.): 9:219-230. 1935.

(EXTENSION PLANT PATHOLOGIST, LINCOLN, NEBRASKA).

SOME OBSERVATIONS ON TOBACCO DISEASES IN VIRGINIA IN 1941

S. B. Fenne

Black shank, Phytophthora parasitica var. nicotianae, known to be in Mecklenburg and Halifax Counties since 1939, appeared during 1941 on 2 additional farms in Halifax County and on 5 farms in Pittsylvania County. The infestation on 2 of the farms in Pittsylvania County was probably present as early as 1939, but was not seen until this year. The total tobacco allotment acreage of the 5 farms in Pittsylvania County was 48.9; of which 25.8 acres are infested with black shank. The losses due to black shank ranged from 5 percent on certain farms to 90 percent on other farms in both Halifax and Pittsylvania Counties.

Downy mildew, Peronospora tabacina, was of minor importance during 1941. The extremely dry weather, with extremely high temperatures, completely checked the disease before injury occurred. The average temperature for the week, May 19 to May 25, was 73°F. with precipitation negligible or less than 0.2 of an inch. A trace of downy mildew appeared quite generally in the eastern flue-cured tobacco counties about May 5; however, it disappeared completely within a few days, causing no apparent injury.

Granville wilt, Phytomonas solanacearum, has been increasing quite rapidly during the past few years, or ever since downy mildew caused growers to go into other areas of Virginia and adjoining States to purchase plants. In many instances growers who purchased plants from the outside brought in diseased seedlings, thereby introducing Granville wilt to their farms. The common practice followed by many growers of planting tobacco after tobacco has aggravated the situation and increased the amount of disease in many counties. There are now 44 farms, in 9 counties, in Virginia, known to be infested with Granville wilt.

Black root rot, Thielaviopsis basicola, is perhaps the most important disease of Burley tobacco in Virginia. Growers in Southwest Virginia have been urged to plant root-rot resistant varieties such as Kentucky 16 on farms infested with black root rot. Wherever this variety has been grown very good yields of tobacco have been obtained. Seed are readily available from several certified seed growers in Southwest Virginia. Black root rot is not generally so severe in the dark tobacco

belt; but its status in the bright tobacco area is still problematical. Several resistant flue-cured varieties, including "Yellow Special" have been developed and can be grown on those farms in the flue-cured belt where black root rot is a problem. No satisfactory black-root-rot resistant varieties of dark tobacco are available in Virginia. Black root rot, in 1941, caused a loss throughout the State of approximately 3 percent.

Sore shin, Rhizoctonia solani, and stem rot, Sclerotium rolfsii, are old offenders in Virginia, although sore shin appears to be more prevalent. One or both of these diseases appear to be present in varying amounts wherever tobacco is grown but our records during the past few seasons indicate they are becoming increasingly injurious. More information is desirable concerning both diseases; particularly since no satisfactory control measures are known. It would be hazardous to estimate the losses occasioned by these diseases during the 1941 season since so many of the growers are resigned to their presence and do not bother to report them.

Common mosaic, a virus disease, was more severe this year than usual. Even in the flue-cured area where this disease is usually of small consequence, mosaic was a serious problem on a number of farms. On several occasions, plantings of flue-cured tobacco amounting to as much as 10 acres per farm were 60 to 100 percent infected with common mosaic. Several of these appeared to have become inoculated at transplanting. It was clearly demonstrated at the time that the principal means of spread of common mosaic was through the use of home-cured chewing tobacco while handling plants. It was not possible to secure State-wide data on the losses occasioned by common mosaic, but we know that many individual growers suffered severe losses.

Ring-spot, another virus disease, was frequently found in the dark tobacco belt and to a less extent in the Burley and flue-cured areas. Our experience this season would indicate that ring-spot may approximate the distribution and severity of common mosaic unless a more satisfactory control program is forthcoming in the immediate future. It has been observed repeatedly that ring-spot is much more severe in those tobacco fields in the vicinity of lespedeza, clover, and alfalfa.

Brown spot, Alternaria longipes, which caused such severe damage in 1940, was of minor importance during the past season. This may have been due in part to the exceedingly dry weather during the latter part of the 1941 growing season, and probably to a less extent to the higher potash content of fertilizers being used by many of our tobacco growers.

Black fire, Phytomonas angulata, and wildfire, P. tabaci, were not observed within the State during the past year.

Root knot, Heterodera marioni, is a disease of comparatively minor importance in Virginia; however, it was observed in some light sandy fields in the eastern and southern tobacco areas. Much of our tobacco is grown on stiff red soil on which root knot does not usually become severe; but our attention was called to several farms in Pittsylvania County last season, having light textured soils, on which root knot appeared to be a limiting factor in flue-cured production.
(EXTENSION PLANT PATHOLOGIST).

SPREAD OF WHITE PINE BLISTER RUST IN SOUTHERN APPALACHIAN STATES IN 1941

Roy G. Pierce

During 1941 the spread of white pine blister rust, Cronartium ribicola, to new counties in the Southern Appalachian States extended from Raleigh County, West Virginia to McDowell County, North Carolina, a distance of about 134 miles. A continuous belt of 16 new counties has been added to those in which the blister rust has already been reported.

These newly infected counties include Mercer, Monroe, Raleigh, and Summers in West Virginia; Bland, Giles, Grayson, Pulaski, Smyth, and Wythe in Virginia; Ashe, Avery, McDowell, and Watauga in North Carolina; and Carter and Johnson in Tennessee. Although white pines were frequently examined in all of these counties the blister rust was found only on wild Ribes. In West Virginia all of the infected bushes were Ribes cynosbati, the prickly-berried gooseberry. In Virginia and North Carolina both cynosbati and rotundifolium, the round leaf gooseberry, were found infected in about even numbers. In addition, americanum, the wild black currant, was found at one place in North Carolina. In Tennessee both infections were found on cynosbati.

In West Virginia there were 8 new infection centers, in Virginia 8, in North Carolina 17, and in Tennessee 2, making a total of 35 new centers in 16 counties.

In West Virginia all infections were in white pine zones from 1,750 to 2,750 feet elevation. In Virginia the elevation of infected bushes ranged from 2,450 to 3,500 feet, in Tennessee from 3,500 to 3,800 feet, and in North Carolina from 3,000 to 5,000 feet. In the latter State a number of the infections were found above the white pine belt.

The infections were found from September 16 to November 6. All of the 17 infections in North Carolina showed telia while 3 in Watauga County also showed uredinia. In West Virginia both uredinia and telia were found. In Virginia 1 infection showed uredinia while all 8 showed telia. In Tennessee both infections showed telia.

For 25 of the 35 infections, data is available on the aspect or exposure of the site on which infected Ribes were located. Fifteen places had a northern, northeastern or northwestern exposure, 4 places had a southern exposure, 3 had an eastern exposure, 1 had a western exposure while 2 were on flat land. Infected bushes were for the most part medium to large in size, although at 2 locations in West Virginia they were small.

The explanation of the rather extensive spread this year is not entirely clear, but it is probably due to favorable climatic conditions in this region as no diseased pines were found in the newly infected counties.

According to monthly bulletins of the U.S. Weather Bureau on Climatological data for the 4 States concerned, weather conditions in April and June were conducive to the spread of the rust from pine to Ribes in the newly infected counties. There were several warm to hot days in late April with frequent rainfall and cloudy weather, and 3 continuous spells of rainy weather in June from the 1st to 5th; 8th to 15th,

and 23rd to 30th. In the northwestern counties of North Carolina rainy weather prevailed throughout July and August making conditions favorable for the spread of the rust from bush to bush in the uredinial stage. In southern Virginia and West Virginia rainfall for July was generally above normal.

Agent Ralph W. Welch of West Virginia found the first Ribes infection in a new county on September 16. He then trained his foreman and crew men in identification of the rust and they found 5 out of the 8 new West Virginia infections, including the only infection found in 2 of the 4 counties. The first infection found in North Carolina was by Agent H. A. Whitman on October 1, while the first Tennessee infection was found by Messrs. J. Curtis Ball of the Richmond office and Agent J. Wilburn Lane of Tennessee on October 10. Others who participated in the search for the rust were State leaders J. G. Luce, Jr., of Virginia, R. D. Tanksley of Tennessee, H. B. Teague of North Carolina, H. E. Yost of Maryland, and Agents Oscar V. Coulter, George C. Cramer, Walter Stegall, and the writer. All rust identifications involving new counties were confirmed either by the Division of Forest Pathology of the Bureau of Plant Industry, the regional leader of blister rust control for the Southern Appalachian States, or other specialists of long experience in blister rust control work.

This southward spread of the rust on Ribes is not especially important from a control standpoint, since practically all of the valuable white pine stands within the newly infected counties already have been protected by the initial eradication of Ribes. Thus, serious damage to pine growing within control areas has been prevented in advance of the invasion by the rust. The places where diseased Ribes were found were outside the boundaries of control areas, and while white pines were growing nearby in some cases, they were too few and scattered to be of sufficient value to justify control work. Such areas are scattered throughout the white pine region, and in these locations some damage and loss of white pine trees from blister rust is to be expected.
(PATHOLOGIST, BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE).

PRELIMINARY CHECK LIST OF ENTOMOGENOUS FUNGI OF NORTH AMERICA

A "Preliminary Check List of the Entomogenous Fungi of North America", by Miss Vera K. Charles, of this Division, has been issued as a supplement to The Insect Pest Survey Bulletin of the Bureau of Entomology and Plant Quarantine. This list has been prepared from the records available in the Division of Mycology and Disease Survey, and from the rather scattered literature on the subject. Fungi parasitic on insects are listed alphabetically with their insect hosts and with the distribution indicated by States and countries for North and Central America and the West Indies. Selected references to the literature on the subject are also included. Miss Gertrude Myers, of the Division of Insect Pest Survey Information, Bureau of Entomology and Plant Quarantine, has added an alphabetical list of the insect hosts involved. A supply of this publication is

now available and copies will be sent to collaborators and others interested on request to the Plant Disease Survey.

As indicated by the title the list is considered as a preliminary one, and it is hoped that entomologists, mycologists, and others concerned will report new fungi and new hosts as well as further distributional records. Such assistance will be appreciated, and will help to make possible in the future a more complete list.

CORRESPONDENCE

In transmitting an article by Dr. Elmer appearing in this issue, Dr. Melchers displays a constructive attitude so helpful that we take the liberty of reproducing his letter. As implied in the statement on the cover page, the Reporter always welcomes for prompt publication preliminary reports, comments, and suggestions. They are doubly welcome in the present emergency when they may contribute to the success of the Food for Victory campaign.

The letter follows:

> "I am transmitting herewith a timely short manuscript on the use of Spergon for sweetpotato seed and sprout treatments by O. H. Elmer of this department.
>
> "The results have been so encouraging and in view of the critical food situation, we believe that this should come to the attention of the sweetpotato growing sections of the United States without delay. Dr. Elmer had originally intended to carry out another year or two of work before publishing this, but we have felt that in this emergency it should not be delayed.
>
> "May I suggest that this be printed in the Plant Disease Reporter just as soon as possible for the reason that it should be available in the next few weeks because of sweetpotato bedding in the southern States." --L. E. Melchers, Collaborator, January 16.

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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In brief notes, page 75, William W. Diehl reports a leaf spot of Duranta new to Florida; and G. W. Carver reports Diplodia causing deterioration of okra fiber in Alabama.

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No phony peach in Oklahoma, a correction, page 82.

CHECK LIST REVISION

Freeman Weiss

PSEUDOLARIX (PINACEAE)

PSEUDOLARIX AMABILIS (Nels.) Rehd., GOLDENLARCH. Deciduous tree of China, cult. for ornament, Zone V.

Dasyscypha willkommii (Hartig) Rehm, canker. Mass.

PSEUDOTSUGA (PINACEAE)

PSEUDOTSUGA MACROCARPA (Torr.) Mayr, BIGCONE-SPRUCE. Large evergreen tree of Growth Regions 4, 5, 10.

Melampsora albertensis Arth., needle rust (0,I). Calif. II and III on Populus spp.
Phytomonas pseudotsugae (Hansen & R.E.Smith) Bergey et al., bacterial gall. Calif.

P. TAXIFOLIA (Poir.) Rehd., DOUGLAS-FIR. Large evergreen tree, very variable, existing in several geographic forms, sometimes distinguished as 3 botanical vars., or 2 spp. and 1 var. The coast form, var. VIRIDIS (Schwer.) Aschers. & Graebn., occurs in Growth Regions 1, 2, 3, 4, 5, 6; the intermountain form, var. CAESIA (Schwer.) Aschers. & Graebn., occurs in G.R.'s 6, 7, 12; their cult. zone limit is VI. The mountain form, var. GLAUCA (Mayr) Schneid. occurs in G.R.'s 9, 11, 13, 14, 16, and is hardy in Zone IV.

(Adelopus gäumanni Rohde): Phaeocryptopus gäumanni.
Aleurodiscus spp., on bark, sometimes weakly parasitic. A. amorphus (Pers.) Rabh., widespread; A. subcruentatus (Berk. & Curt.) Burt, Calif. & Oregon; and others.
Arceuthobium douglasii Engelm., dwarf mistletoe, witches'-broom. Mont. to Colo. and eastern Oregon & Wash.
Armillaria mellea Vahl ex Fr., root rot. Cosmopolitan.
Botrytis cinerea Pers. (B. douglasii Tub.), gray mold twig blight, snow mold of seedlings. Cosmopolitan.
Ceratostomella pseudotsugae Rumbold, sapwood stain. Oregon, Wash.
Chondropodium pseudotsugae White, bark canker. Oregon.
Cryptosporium boycei Dearn., bark canker (secondary). Wash.
Cytospora sp., twig canker. (Conidial stage of Valsa abietis ?) Colo., N.J. (cult.), Oregon.
Dasyschypha ellisiana (Rehm) Sacc., twig canker. Mass., N.Car., R.I.
D. pseudotsugae Hahn, branch & trunk canker. Calif. to Wash. (Other Dasyscypha spp. are saprophytic on branches & twigs, as D. agassizii (Berk. & Curt.) Sacc., D. arida (Phill.) Sacc., and D. ciliata Hahn in the West; D. calycina Fckl. in Mass. & R.I.; D. oblongospora Hahn & Ayers in the N.E. States.)

(Diplodia pinea (Desm.) Kickx): Sphaeropsis ellisii
Echinodontium tinctorium (Ell.) Ell. & Ev., brown stringy heart rot. Mont. to Utah and Wash.
Endoconidiophora coerulescens Münch, sapwood stain. Calif.
Fomes annosus (Fr.) Cke., brown root & butt rot, white pocket rot. Mont. to Oregon & Wash.
F. applanatus (Pers. ex Fr.) Gill., white mottled root & butt rot. Mont. to Oregon & Wash.
F. officinalis (Vill. ex Fr.) Faull (F. laricis (Jacq.) Murr.), reddish brown trunk rot. Mont. to Calif. & Wash.
F. pini (Brot. ex Fr.) Karst. (Trametes pini Brot. ex Fr.), red ring rot, white pocket heart rot. Widespread.
F. pinicola (Sw. ex Fr.) Cke., brown cubical trunk rot. Widespread.
F. putearius Weir (= F. nigrolimitatus Romell ?), white pocket rot. Mont., Wash.
F. roseus (Alb. & Schw. ex Fr.) Cke., yellow-brown trunk rot, brown cubical rot. Widespread.
F. subroseus (Weir) Overh., brown cubical rot. Widespread.
Fusarium spp., seed rot, damping off. F. moniliforme Sheldon and F. solani (Mart.) App. & Wr. among others, shown pathogenic. Cosmopolitan.
Ganoderma oregonense Murr., white pocket rot. Mont., Wash.
Herpotrichia nigra Hartig, brown felt blight. Rocky Mts. and Pacific Northwest.
Hydnum coralloides Scop. ex Fr., white pocket rot, sometimes on living trees. Pacific Northwest.
Lentinus lepideus Fr., brown cubical rot of logs & timber, sometimes heart rot of living trees. Pacific Northwest.
Lenzites saepiaria Wulf. ex Fr. and L. trabea Pers. ex Fr., brown sapwood rot of slash & logs. Widespread.
Leptothyrium pseudotsugae Dearn., flyspeck, on needles. Colo.
Melampsora albertensis Arth. (Caeoma occidentale Arth.), needle rust (O, I). Mont. to Colo., Utah, & Wash. II and III on Populus spp.
Phacidium infestans Karst., snow blight. Idaho.
Phaeocryptopus gäumanni (Rohde) Petr. (Adelopus gäumanni Rohde), needle cast. Endemic but noninjurious in the Pacific Coast States, usually on the coast form (var. viridis), infrequently on the intermountain and mountain forms; pathogenic to planted Douglas-firs in the N.E. States. (The spelling gäumanni was used in the original description, and gaeumanni in the above combination; neither name accords fully with the recommendations under International Rules.)
Phoma (Sclerophoma) douglasii Oud., on twigs. Colo.
Phomopsis lokoyae Hahn, stem canker. Pacific Coast States. Only on the var. viridis.
P. occulta Trav., on dead twigs. Widespread. Conidial stage of Diaporthe conorum (Desm.) Niessl.
Phyllosticta sp., on needles. Oregon.

PSEUDOTSUGA -- Continued.

Phytomonas pseudotsugae (Hansen & R.E.Smith) Bergey et al., bacterial gall. Calif.

Polyporus spp., rot of trunks, logs & slash, characteristically white pocket or spongy; sometimes sapwood or heart rot of living trees. Occasional to general in range of host. Spp. reported include P. abietinus Dicks. ex Fr., P. adustus Willd. ex Fr., P. alboluteus Ell. & Ev., P. amorphus Fr., P. fibrillosus Karst., P. guttulatus Pk., P. hirsutus Wulf. ex Fr., P. leucospongia Cke. & Harkn., P. resinosus Schrad. ex Fr., P. versicolor L. ex Fr., P. volvatus Pk.

P. anceps Pk. (P. ellisianus (Murr.) Long), red-ray heart rot. Idaho, Wash.

P. circinatus Fr., root & butt rot, white pocket heart rot. Idaho.

P. schweinitzii Fr., reddish brown root, butt and heart rot. Widespread, including planted Douglas-firs in the East.

P. sulphureus Bull. ex Fr., brown cubical heart rot. Widespread.

Poria spp., rot of logs & slash. Occasional throughout range of host. Spp. reported include P. cinerescens Bres., P. dichroa Bres., P. lenis Karst., P. purpurea (Fr.) Cke., P. subacida (Pk.) Sacc., P. weirii Murr., P. xantha (Fr.) Lind.

P. incrassata (Berk. & Curt.) Burt, dry rot of timber. Pacific Northwest.

Pucciniastrum goeppertianum (Kühn) Kleb., needle rust (0,I). Mont. III on Vaccinium spp.

Pythium ultimum Trow., damping off. Colo.

Rhabdocline pseudotsugae Syd. (Rhabdogloeum pseudotsugae Syd.), needle cast. Pacific Northwest, also Ariz., Colo. & Calif., probably general in range of host; Mass., N.Y., R.I. (cult.). Occurs on both coast & intermountain forms, especially the latter.

Rhizina undulata Fr., seedling blight. Pacific Northwest.

Rhizoctonia solani Kühn, damping off. Cosmopolitan.

Sparassis radicata Weir, yellow mottled root rot. Pacific Northwest.

Sphaeropsis ellisii Sacc., dieback, collar rot, seedling blight. Calif., Kans., N.J., N.Y.

Stereum spp. (S. chailletii Pers. ex Fr., S. sanguinolentum Alb. & Schw. ex Fr., S. sulcatum Burt.), white pocket rot of logs & slash. Pacific Northwest.

Thelephora terrestris Ehrh. ex Fr., smothering of seedlings. Pacific Northwest.

Trametes spp., rot of logs & timber. Pacific Northwest. Spp. reported include T. americana Overh., T. heteromorpha (Fr.) Lloyd, T. hispida Bagl., T. isabellina Fr., T. serialis Fr.

Valsa abietis Fr., on twigs & branches. Colo., Oregon, Wash.

PSIDIUM (MYRTACEAE)

PSIDIUM GUAJAVA L., COMMON GUAVA. Shrub or small tree of tropical America, widely cult. for fruit in warm regions, naturalized in Hawaii. Several other spp. also are cult. especially P. CATTLEIANUM Sabine, STRAWBERRY GUAVA.

PSIDIUM -- Continued.

Asterina psidii Ryan, black patch. P.R.
Botryosphaeria ribis var. chromogena Shear et al., on branches. Fla., T.H.
Caudella psidii Ryan, black patch. P.R.
Cephaleuros virescens Kze., green scurf, algal spot. Fla., P.R.
Cercospora psidii Rangel, leaf spot. Fla.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Colletotrichum gloeosporioides Penz., anthracnose. Conidial stage of Glomerella cingulata.
Corticium stevensii Burt, thread blight. Fla.
Glomerella cingulata (Ston.) Spauld. & Schrenk (G. psidii (Del.) Sheldon), anthracnose, leaf & fruit spot, ripe rot. Fla., P.R., T.H.
Heterodera marioni (Cornu) Goodey, root knot. Fla.
Meliola psidii Fr., black mildew. P.R., Canal Zone.
Polyporus versicolor L. ex Fr., wound rot. Calif.
Puccinia psidii Wint., rust (II). P.R.
Trametes corrugata Pers. ex Bres., wood rot. T.H.
Trichomerium portoricense Speg., on leaves. P.R.

PSYCHOTRIA (RUBIACEAE)

PSYCHOTRIA spp., WILD-COFFEE. Tropical shrubs or trees; S. NERVOSA Sw., BALSAMO and S. UNDATA Jacq. occur in S. Fla. and West Indies, sometimes planted for ornament.

Asterina acanthopoda Speg. and A. psychotriae Ryan, black patch. P.R.
Irene seminata (Berk. & Curt.) Seaver & Chardon, black mildw. P.R.
Irenina isertiae F.L. Stevens, black mildew. Canal Zone.
Irenopsis bayamonensis (Tehon) F.L. Stevens, black mildew. P.R.
Microthyrium psychotriae (Doidge) Toro, black patch. P.R.
Omphalia flavida (Cke.) Maubl. & Rang., leaf spot. P.R.
Puccinia fallaciosa Arth., rust (II,III). P.R.

PTELEA (RUTACEAE)

PTELEA TRIFOLIATA L., HOP-TREE. Deciduous shrub or small tree of Growth Regions 11,16,17,20,22,23,24,25,27,28,29; grown for ornament, Zone IV.

Cercospora afflata Wint. and C. pteleae Wint., leaf spot. Ind., Mo.
Mycosphaerella sp., on leaves. Texas.
Phleospora pteleae Tharp, leaf spot. Texas.
Phyllosticta pteleicola Tehon & Daniels, leaf spot. Ill.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Puccinia windsoriae Schw., rust (O,I). N.Y. to Ala. & Kans. II and III on Poaceae (Tridens flavus (L.) Hitchc.)
Septoria pteleae Ell. & Ev., leaf spot. Ind., Wis.

PUNICA (PUNICACEAE)

PUNICA GRANATUM L., POMEGRANATE. Partly deciduous shrub or small tree of the Mediterranean region, cult. for ornament & fruit, Zone VII. A dwarf var. nana (L.) Pers., is hardy in Zone VI.

Alternaria sp., fruit rot. Calif.
Aspergillus niger Tiegh. (Sterigmatocystis castanea Patters.), internal rot. Ariz., Calif., Texas.
Botrytis cinerea Pers., gray mold rot. Cosmopolitan.
Cercospora lythracearum Heald & Wolf, leaf blotch. Conidial stage of Mycosphaerella lythracearum.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Colletotrichum sp. (? gloeosporioides Penz.), anthracnose, fruit spot. Fla., P.R.
Corticium stevensii Burt, thread blight. Fla.
Heterodera marioni (Cornu) Goodey, root knot. Miss.
Mycosphaerella lythracearum Wolf (Cercospora lythracearum Heald & Wolf), leaf blotch, fruit spot. Fla. to Miss., Texas.
Nematospora coryli Peg., dry rot of fruit. Calif.
Penicillium expansum Lk. ex Thom, blue mold rot. Cosmopolitan.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

PYRACANTHA (ROSACEAE)

PYRACANTHA COCCINEA Roem., FIRETHORN. Large evergreen shrub of S. Europe to W. Asia, cult. for ornament, Zone VI, locally naturalized in Growth Regions 27, 28, 29. The var. LALANDII Dipp. is hardier and more commonly seen in cult. P. ANGUSTIFOLIA (Franch.) Schneid., P. CRENULATA (Roxb.) Roem and P. CRENATO-SERRATA (Hance) Rehd. of C. to S.W. Asia also are cult. in the same range.

Armillaria mellea Vahl ex Fr., root rot. Calif.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., canker. Miss.
Diplodia ? crataegi Westend. (=D. sarmentorum Fr.), twig blight. Pa.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Widespread. (Infects all spp. named but some are relatively resistant.)
Fusicladium pyracanthae (Otth.) Rostr., scab (on leaves & fruit). Widespread.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Septobasidium cokeri Couch and S. mariani Bres., on scale insects infesting bark. N.J.

PYRUS (ROSACEAE)

PYRUS spp. (other than P. communis and its hybrids). Chiefly Asiatic spp. of small, deciduous trees grown in U.S. for ornament or understocks for pear, as P. betulaefolia Bge., P. calleryana Dcne., P. salicifolia Pall., P. ussuriensis Maxim.; hardy in Zones IV or V.

Erwinia amylovora (Burr.) Winslow et al., fire blight. Occasional in Ill., N.Y., Va. but very resistant.
Fabraea maculata Atk., leaf spot. Va.
Gymnosporangium nootkatense (Trel.) Arth., leaf rust (O,I). On P. betulaefolia. Alaska. II and III on Chamaecyparis nootkatense (Lam.) Spach.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Md.

PYRUS COMMUNIS L., PEAR. Tree of Europe & W. Asia, cult. for fruit, Zone IV.

Alternaria sp. (A. mali Roberts), black mold rot of fruit, leaf spot. Occasional in West.
Armillaria mellea Vahl ex Fr., root rot. Widespread.
Aspergillus spp. (A. flavus Lk., A. pyri English), storage rot. Cosmopolitan.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., black rot of fruit. Va.
Botrytis cinerea Pers., gray mold rot, blossom blight, twig blight. Widespread.
Cephalosporium carpogenum Ruehle, storage rot. Oregon, Wash.
Cephalothecium roseum Cda., pink mold rot. Occasional.
Cercospora spp., leaf spot. C. minima Tr. & Earle, Fla. to Texas; C. pyri Farl., Mich.
Cladosporium sp. (C. herbarum Lk.), green mold rot. Occasional.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. La.
Coniothyrium pyrina (Sacc.) Sheldon, leaf spot. Mass. to Ala. Texas & Iowa. (Possibly identical with C. tirolense Bubak.)
Corticium koleroga (Cke.) Höhn., thread blight. La., N.Car.
C. stevensii Burt, N.Car. to Fla. & Texas; W. Va.
C. salmonicolor Berk. & Br., twig blight. Fla., La.
Coryneum foliicolum Fckl., leaf spot. Ind.
C. microstictum Berk. & Br. and C. longistipitatum Berl. on twigs. Fla., N.J.
Cylindrocarpon spp. (C. magnusianum Wr., C. radicicola Wr., C. obtusisporum (Cke. & Harkn.) Wr.), on branches associated with cankers. Conidial stages of Nectria spp.
Cytospora spp., canker. Oregon, Va., Wash.
Diplodia spp., on twigs & branches. (D. maura Cke. & Ell., Ala., Kans., N.J.; D. pyrenophora Fr., N.J.; D. sarmentorum Fr., Oregon)
Entomosporium maculatum Lév., leaf spot. Conidial stage of Fabraea maculata.
Erwinia amylovora (Burr.) Winslow et al., fire blight. General on P. communis vars. but some communis x pyrifolia hybrids are resistant.
E. carotovora (Jones) Holland, fruit rot. Mass.
Fabraea maculata Atk., leaf blight, black spot of fruit. General.
Fomes igniarius (L. ex Fr.) Kickx, white heart rot. Occasional.
F. pinicola (Sw. ex Fr.) Cke.
Fusarium spp., twig blight, canker. Occasional. (Spp. reported include F. acuminatum Ell. & Ev., F. avenaceum (Fr.) Sacc., F. lateritium Nees, F. sambucinum Fckl.)

PYRUS -- continued.

Fusicladium pyrinum (Lib.) Fckl., scab. Conidial stage of Venturia pyrina.
Gloeodes pomigena (Schw.) Colby, sooty blotch. Eastern States to Okla. & Texas.
Gloeosporium sp. (conidial stage of Glomerella cingulata), fruit rot. Widespread.
G. malicorticis Cordley. Conidial stage of Neofabraea malicorticis.
G. perennans Zeller & Childs. Conidial stage of Neofabraea perennans.
Glomerella cingulata (Ston.) Spauld. & Schrenk, bitter rot (fruit), twig & branch canker. Widespread but not destructive.

Gymnosporangium clavipes Cke. & Pk., rust (O, I) chiefly on fruit. La. Texas. III on Juniperus communis L. & J. virginiana L.
G. clavariaeforme (Jacq.) DC., rust (O,I) on leaves & fruit. S.Car. III on Juniperus communis L.
G. globosum Farl., rust (O,I) on leaves & fruit. Eastern States to Iowa & Minn. III on Juniperus virginiana L.
G. kernianum Bethel, rust (O,I) on leaves. Ariz. III on Juniperus occidentalis Hook. and J. pachyphlaea Torr.
G. libocedri (P. Henn.) Kern, rust (O,I) on leaves & fruit. Calif., Oregon. III on Libocedrus decurrens.
G. nelsoni Arth., rust (O,I) on leaves & fruit. Ariz., Colo. III on Juniperus spp.
Helminthosporium papulosum Berg, bark canker. Miss.
Hendersonia cydoniae Cke. & Ell., leaf spot. N.Y.
H. foliorum Fckl. Texas
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly-speck. Eastern States.
Monilinia fructicola (Wint.) Honey, brown rot. Eastern States.
M. laxa (Aderh. & Ruhl.) Honey, brown rot, blossom blight. Pacific Coast States.
Mycosphaerella sentina (Fr.) Schroet. (Septoria pyricola Desm.), ashy leaf spot, fruit spot. Widespread, chiefly in the East.
M. tulasnei (Jancz.) Lindau, Oregon, Wash.
Myxosporium corticolum Edg. (Cryptosporiopsis corticola (Edg.) Nannf.), bark canker. N.Y. to Mich. & Miss., Oregon. Conidial stage of Pezicula corticola (Jörg.) Nannf.
Nectria cinnabarina (Tode ex Fr.), coral spot, dieback. Widespread.
N. galligena Bres., trunk canker. Oregon, Wash.
Neofabraea malicorticis Jacks. (Pezicula malicorticis (Jacks.) Nannf.) black-spot canker. Oregon, Wash.
N. perennans Kienholz (Gloeosporium perennans Zeller & Childs), perennial canker. Oregon, Wash.
Neurospora sitophila Shear & Dodge, ripe rot. N.Car.
Nummularia discreta (Schw.) Tul., blister canker. Del., Iowa.
Penicillium spp., blue mold rot. Widespread. Spp. reported include P. chrysitis Biourge, P. cyclopium Westling, P. expansum Lk. ex Thom, P. puberulum Bainier, P. roquefortii Thom, P. terrestre Jensen

PYRUS -- continued.

Phoma exigua Desm. and P. mali Schultz & Sacc., storage rot. Wash.
Phomopsis ambigua (Sacc.) Trav., twig blight. Widespread. (Conidial stage of Diaporthe ambigua Nits. = D.eres Nits.).
P. mali Roberts, bark canker. Calif.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
P. flavescens var. macrophyllum Engel. Ariz., N.Mex.
(Phyllosticta pirina Sacc.): Coniothyrium pyrina.
P. pyrorum Cke., leaf spot. Ill., Miss., S.Car.
P. solitaria Ell. & Ev. Md.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas & Okla. to Ariz.
Physalospora obtusa (Schw.) Cke., black rot, leaf spot, canker. Widespread. P. fusca N.E. Stevens and P. rhodina (Berk. & Curt.) Cke. also reported from N.J. & Va.
Phytomonas syringae (Van Hall) Bergey et al., blossom & twig blight, canker. Ark., Calif.
P. tumefaciens (EFS. & Town.) Bergey et al., crown gall. General.
Phytophthora cactorum (Leb. & Cohn) Schroet., collar rot, fruit rot. Widespread.
P. citrophthora (R.E. & E.H.Smith) Leonian, collar rot. Calif.
Pleospora fructicola Ruehle, storage rot. Wash.
Podosphaera leucotricha (Ell. & Ev.) Salm., powdery mildew. Colo., Oregon, Wash.
P. oxyacanthae (DC.) DBy. N.J.
Polyporus spp., trunk rot, sometimes wound rot or heart rot of living trees. Spp. reported include P. gilvus (Schw.) Fr., Ind., N.Y.; P. lacteus Fr.; P. squamosus Huds. ex Fr.; P. sulphureus Bull. ex Fr.; P. versicolor L. ex Fr., widespread; P. zonatus Fr., Oregon.
Pratylenchus pratensis (DeMan) Filip., in roots, associated with little-leaf. Calif.
Rhizopus nigricans Ehrh., black mold rot. Cosmopolitan.
Sclerotinia spp., brown rot. See Monilinia.
S. sclerotiorum (Lib.) DBy., fruit rot. Calif., Wash.
Schizophyllum commune Fr., trunk rot, sometimes of living trees. Cosmopolitan.
Septobasidium spp., on scale insects infesting bark. N.Car. to Fla. & Texas. Spp. reported include S. burtii Lloyd, S. curtisii (Berk. & Desm.) Boed. & Stein., S. pseudopedicellatum Burt, S. retiforme (Berk. & Curt.) Pat.
Septoria piricola Desm., leaf spot. Conidial stage of Mycosphaerella sentina.
Sphaeropsis malorum Pk., black rot. Conidial stage of Physalospora obtusa.
Sporotrichum malorum Kidd & Beaumont, storage rot. Oregon, Wash.
Stereum hirsutum Wulf. ex Fr., trunk rot.
S. purpureum Pers., heart rot, ? silver leaf. N.Y., Oregon.
Valsa leucostoma Pers. ex Fr., twig blight. Wash.
Venturia pyrina Aderh., scab. General.

PYRUS -- continued.

Xylaria sp., root rot. Idaho, Ind.
Physiological diseases.
Bitter pit (possibly identical with cork and drought spot) -- attributed to deficiency or irregularity of moisture supply during growth. Pacific Coast States, N.Y.
Black end -- associated with use of Oriental pear rootstocks and occurring on shallow, poorly drained soil. Pacific Coast States.
Black leaf (sometimes associated with rough bark) -- undet. Calif.
Brown bark spot (? measles) -- undet., possibly nutritional deficiency. Pacific Northwest, Fla., Ind.
Brown blotch (of fruit, especially Kieffer var.) -- undet. Eastern States.
Chlorosis -- mineral deficiency, soil alkalinity. Texas, Pacific Coast States.
Core breakdown, brown heart (chiefly in stored fruit) -- overmaturity.
Cork, drought spot -- boron deficiency. Pacific Coast States, Texas.
Exanthema -- copper deficiency. Calif., Fla.
Little leaf, rosette -- nutritional deficiency, ? zinc or boron. Calif., Wash. (Sometimes associated with root infestation by Pratylenchus pratensis.)
Marginal leaf blight, leaf scorch -- nutritional deficiency, ? calcium or potassium. Idaho, Wash.
Red leaf (especially in Oriental pear hybrids) -- undet. but probably a general response to adverse growing conditions.
Rough bark -- undet. Calif., Wash.
Scald (discoloration of stored fruit) -- immaturity, deficient ventilation.
Stigmonose -- insect punctures during growth of fruit. Widespread.
Target canker (? brown bark spot, measles) -- undet. Ga., N.Y., Va.; ?Calif., Wash.
Virus diseases.
Stony pit -- Marmor pyri Holmes. Pacific Coast States.

PYRUS PYRIFOLIA (Burm.) Nakai (P. serotina Rehd., P. sinensis auth.), SAND PEAR. Chinese tree sometimes cult. for fruit, Zone V. P. LECONTEI (P. pyrifolia x communis) furnishes the Kieffer, LeConte, and similar vars.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Corticium stevensii Burt, thread blight. Miss.
Erwinia amylovora (Burr.) Winslow et al., fire blight (resistant). Occasional.
Fabraea maculata Atk., leaf blight. La., Md., Miss., N.Y.
Glomerella cingulata (Ston.) Spauld. & Schrenk, bitter rot. Miss.

PYRUS -- continued.

Gymnosporangium clavipes Cke. & Pk., rust (O,I). Ark.
G. haraeanum Syd., leaf rust (O,I). Calif., Oregon. III on Juniperus chinensis.
Monilinia fructicola (Wint.) Honey, brown rot. Va.
Mycosphaerella pyrina (Ell. & Ev.) Miller, on leaves. Ga.
M. sentina (Fr.) Schroet., leaf spot. Kans., Miss., Texas.
Physalospora obtusa (Schw.) Cke., black rot. Miss.
Phytomonas syringae (Van Hall) Bergey et al., canker. Calif.
Tryblidiella fusca (Ell. & Ev.) Rehm, on dead branch, possibly wound-parasitic. Fla.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

GRASS DISEASES IN MICHIGAN IN 1941

John R. Hardison

This is the second consecutive, annual report of the grass diseases occurring in Michigan. The writer's grass nursery served as a basis for the report augmented by additional collections in southern Michigan. Crown rust (Puccinia coronata) and leaf rust (Puccinia poae-sudeticae) were noted to be less in evidence, but most other diseases were observed to be more prevalent and more serious than in 1940. Stagonospora bromi caused a serious spotting of leaves, sheaths and stems of several species of Bromus and was by far the most destructive disease of brome grasses observed. This disease reached an epiphytotic development, although it has been more or less unreported for the United States. The rust parasite (Darluca filum) was very prevalent on crown rust (Puccinia coronata), stem rust (Puccinia graminis), brown stripe rust (Puccinia montanensis), Poa leaf rust (Puccinia poae-sudeticae), and leaf rust (Puccinia rubigo-vera). In the case of stem rust, at least notable reductions in rust development were apparently caused by this parasite. Furthermore, numerous cases of unusual leaf and stem spot symptoms were found to be due to heavily parasitized stem rust infections, which in some instances were able to sporulate only very slightly or not at all. Powdery mildew (Erysiphe graminis) was very serious on Poa palustris during May and June resulting in the complete killing of the current growth. Only slight recovery was made during the fall rains. Piricularia grisea and Cercospora setaricola together caused considerable defoliation of Setaria lutescens in several fields being used for forage. The bands disease is reported for the first time on Bromus arvensis, B. japonicus, B. mollis, B. secalinus var. velutinus, B. tectorum var. glabratus, Hordeum murinum, Poa pratensis, and Scleropoa rigida.

The writer is indebted especially to Dr. Roderick Sprague and Dr. George W. Fischer for assistance in determination of the Fungi Imperfecti and Ustilaginales respectively, to Mr. Jason Swallen for checking the identity of the majority of the grasses here reported, and to Dr. E.B. Mains for invaluable suggestions. The specimens of Physarum cinereum were contributed by Mr. Walter Kleinschmidt. Thanks are also due to Dr. H. W. Johnson for checking this report.

HOST INDEX

<u>Aegilops crassa</u> Boiss.
Leaf rust, Puccinia rubigo-vera
Scab (head mold), Fusarium sp.

<u>Aegilops triuncialis</u> L.
Leaf rust, Puccinia rubigo-vera

<u>Agropyron caninum</u> (L.) Beauv.
Ergot, Claviceps purpurea

<u>Agropyron cristatum</u> (L.) Gaertn.
Ergot, Claviceps purpurea
Tar spot, Phyllachora graminis

<u>Agropyron desertorum</u> Schult.
Ergot, Claviceps purpurea

<u>Agropyron inerme</u> (Scribn. and Smith) Rydb.
Brown stripe rust, Puccinia montanensis
Leaf rust, Puccinia rubigo-vera
Leaf spot, Helminthosporium sp.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

<u>Agropyron repens</u> (L.) Beauv.
Ergot, Claviceps purpurea
Leaf blotch, Helminthosporium tritici-repentis
Leaf rust, Puccinia rubigo-vera, and with parasite, Darluca filum
Leaf spot, Phleospora sp.
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis

<u>Agropyron semicostatum</u> (Steud.) Nees ex. Boiss
Ergot, Claviceps purpurea

<u>Agropyron sibiricum</u> (Willd.) Beauv.
Crown rust, Puccinia coronata, and with parasite, Darluca filum
Ergot, Claviceps purpurea
Leaf rust, Puccinia rubigo-vera
Leaf spot, Ascochyta agropyrina
Stem rust, Puccinia graminis

<u>Agropyron smithii</u> Rydb.
Ergot, Claviceps purpurea
Leaf spot, Septoria nodorum
Stem rust, Puccinia graminis

<u>Agropyron spicatum</u> (Pursh) Scribn.
Brown stripe rust, Puccinia montanensis
Leaf rust, Puccinia rubigo-vera
Stem rust, Puccinia graminis, and with parasite, Darluca filum

<u>Agropyron striatum</u> (Steud.) Nees ex Hook.
Ergot, Claviceps purpurea
Stem rust, Puccinia graminis

<u>Agropyron subsecundum</u> (Link) Hitchc.
Brown stripe rust, Puccinia montanensis
Stem rust, Puccinia graminis

<u>Agropyron trachycaulum</u> (Link) Malte (<u>Agropyron pauciflorum</u> (Schwein.) Hitchc.)
Brown stripe rust, Puccinia montanensis
Head smut, Ustilago bullata
Leaf rust, Puccinia rubigo-vera, and with parasite, Darluca filum
Leaf spot, Stagonospora arenaria
Stem rust, Puccinia graminis, and with parasite, Darluca filum

<u>Agrostis alba</u> L.
Leaf rust, Puccinia rubigo-vera
Leaf spot, Colletotrichum graminicolum

<u>Agrostis palustris</u> Huds.
Leaf rust, Puccinia rubigo-vera

<u>Agrostis scabra</u> Willd.
Stem rust, Puccinia graminis

<u>Agrostis stolonifera</u> L.
Stem rust, Puccinia graminis

<u>Alopecurus pratensis</u> L.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

<u>Andropogon furcatus</u> Muhl.
Leaf rust, Puccinia ellisiana

<u>Andropogon scoparius</u> Michx.
Leaf rust, Puccinia ellisiana
Tar spot, Phyllachora graminis

<u>Arrhenatherum elatius</u> (L.)Mert.&Koch.
Leaf spot, Stagonospora arrhenatheri Sm. and Ramsb.

<u>Avena fatua</u> L.
Bends, Cause undetermined

<u>Beckmannia erucaeformis</u> (L.) Host
Stem rust, Puccinia graminis, with parasite, Darluca filum

<u>Bromus arvensis</u> L.
Bends, cause undetermined
Crown rust, Puccinia coronata
Stem rust, Puccinia graminis, with parasite, Darluca filum

<u>Bromus breviaristatus</u> Buckl.
Leaf spot, Stagonospora bromi
Head smut, Ustilago bullata
Stem rust, Puccinia graminis

<u>Bromus carinatus</u> Hook. and Arn.
Leaf spot, Helminthosporium bromi
Leaf spot, Stagonospora bromi

<u>Bromus catharticus</u> Vahl.
Bends, cause undetermined
Head smut, Ustilago bullata

<u>Bromus ciliatus</u> L.
Leaf spot, Helminthosporium sp.

<u>Bromus inermis</u> Leyss.
Ergot, Claviceps purpurea
Leaf, stem and sheath spot, Stagonospora bromi

<u>Bromus japonicus</u> Thunb.
Bends, cause undetermined
Crown rust, Puccinia coronata
Leaf spot, Helminthosporium bromi

<u>Bromus macrostachys</u> L.
Crown rust, Puccinia coronata

<u>Bromus marginatus</u> Nees
Crown rust, Puccinia coronata
Head smut, Ustilago bullata
Leaf spot, Helminthosporium bromi
Leaf stem and sheath spot, Stagonospora bromi
Stem rust, Puccinia graminis

<u>Bromus mollis</u> L.
Bends, cause undetermined
Leaf spot, Helminthosporium sp.

<u>Bromus polyanthus</u> Scribn.
Crown rust, Puccinia coronata
Head smut, Ustilago bullata

<u>Bromus purgans</u> L.
Crown rust, Puccinia coronata
Head smut, Ustilago bullata
Leaf spot, Helminthosporium bromi

<u>Bromus rubens</u> L.
Crown rust, Puccinia coronata

<u>Bromus secalinus</u> var. <u>velutinus</u> (Schrad.) Koch
Bends, cause undetermined

<u>Bromus tectorum</u> var. <u>glabratus</u> Spenner
Bends, cause undetermined

<u>Calamagrostis canadensis</u> (Michx.)Beauv.
Leaf rust, Puccinia pygmaea

<u>Dactylis glomerata</u> L.
Ergot, Claviceps purpurea
Brown stripe, Scolecotrichum graminis
Leaf spot, Stagonospora arenaria
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis, with parasite, Darluca filum

<u>Deschampsia caespitosa</u> (L.) Beauv.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

<u>Digitaria ischaemum</u> (Schreb.) Muhl.
Ustilago rabenhorstiana

Digitaria sanguinalis (L.) Scop.
Leaf and culm disease, Colletotrichum graminicolum

Echinochloa crusgalli (L.) Beauv.
Leaf spot, Epicoccum sp.

Elymus canadensis L.
Brown stripe rust, Puccinia montanensis, and with parasite, Darluca filum
Crown rust, Puccinia coronata
Ergot, Claviceps purpurea
Head smut, Ustilago bullata
Leaf rust, Puccinia rubigo-vera, with parasite, Darluca filum
Brown stripe, Scolecotrichum graminis
Leaf spot, Stagonospora arenaria

Elymus canadensis var. robustus (Scribn. and Smith) Mac kenz. and Bush
Brown stripe rust, Puccinia montanensis
Powdery mildew, Erysiphe graminis

Elymus condensatus Presl.
Brown stripe rust, Puccinia montanensis
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Elymus dahuricus Turcz.
Powdery mildew, Erysiphe graminis
Stem rust, Puccinia graminis

Elymus glaucus Buckl.
Brown stripe rust, Puccinia montanensis, and with parasite, Darluca filum
Leaf spot, Septoria elymi
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Elymus sibiricus L.
Brown stripe rust, Puccinia montanensis, with parasite, Darluca filum
Stem rust, Puccinia graminis

Elymus triticoides Buckl.
Leaf rust, Puccinia rubigo-vera

Elymus villosus Muhl.
Stem rust, Puccinia graminis

Elymus virginicus L.
Brown stripe rust, Puccinia montanensis
Ergot, Claviceps purpurea
Leaf spot, Stagonospora arenaria
Stem rust, Puccinia graminis
Tar spot, Phyllachora graminis

Elymus virginicus var. intermedius (Vasey) Bush
Brown stripe rust, Puccinia montanensis

Festuca idahoensis Elmer
Stem rust, Puccinia graminis with parasite, Darluca filum

Holcus lanatus L.
Leaf spot, Helminthosporium sp.

Hordeum bulbosum L.
Stem rust, Puccinia graminis with parasite, Darluca filum

Hordeum jubatum L.
Leaf rust, Puccinia rubigo-vera
Stem rust, Puccinia graminis

Hordeum jubatum var. caespitosum (Scribn.) Hitchc.
Stem rust, Puccinia graminis

Hordeum murinum L.
Bends, cause undetermined
Stem rust, Puccinia graminis

Hordeum nodosum L.
Stem rust, Puccinia graminis

Hystrix patula Moench
Leaf rust, Puccinia rubigo-vera
Tar spot, Phyllachora graminis

Koeleria cristata (L.) Pers.
Bends, cause undetermined
Stem rust, Puccinia graminis with parasite, Darluca filum

Leersia oryzoides (L.) Swartz
Uromyces halstedii

Lolium multiflorum Lam.
Brown stripe rust, Puccinia montanensis

Lolium perenne L.
Ergot, Claviceps purpurea
Stem rust, Puccinia graminis

Millium effusum L.
Culm disease, Colletotrichum graminicolum

Phleum pratense L.
Brown stripe, Scolecotrichum graminis
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Poa ampla Merr.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Poa arida Vasey
Stem rust, Puccinia graminis

Poa canbyi (Scribn.) Piper
Stem rust, Puccinia graminis with parasite, Darluca filum

Poa compressa L.
Brown stripe, Scolecotrichum graminis
Stem rust, Puccinia graminis

Poa juncifolia Scribn.
Stem rust, Puccinia graminis, and with parasite, Darluca filum

Poa palustris L.
Powdery mildew, Erysiphe graminis

Poa nevadensis Vasey
Stem rust, Puccinia graminis with parasite, Darluca filum

Poa pratensis L.
Bends, cause undetermined
Leaf mold, Physarum cinereum
Leaf rust, Puccinia poae-sudeticae, and parasite, Darluca filum
Leaf spot, Helminthosporium vagans
Leaf spot, Septoria macropoda var. septulata
Leaf spot, Septoria oudemansii
Powdery mildew, Erysiphe graminis
Stripe smut, Urocystis agropyri

Poa stenantha Trin.
Brown stripe, Scolecotrichum graminis

Puccinellia distans (L.) Parl.
Stem rust, Puccinia graminis, with parasite, Darluca filum

Scleropoa rigida (L.) Griseb.
Bends, cause undetermined

Setaria lutescens (Weigel) F.T. Hubb
Leaf spot, Cercospora setaricola
Leaf spot, Piricularia grisea

Setaria viridis (L.) Beauv.
Leaf spot, Piricularia grisea

Sitanion hystrix (Nutt.) J. G. Smith
Stem rust, Puccinia graminis

Sitanion jubatum J. G. Smith
Stem rust, Puccinia graminis

Sorghum vulgare Pers.
Smut, Sphacelotheca sorghi (Link) Clinton

Trisetum flavescens (L.) Beauv.
Culm disease, Colletotrichum graminicolum

PATHOGEN INDEX

Cause undetermined

Bends [1]
- Avena fatua
- Bromus arvensis
- Bromus japonicus
- Bromus mollis
- Bromus secalinus var. velutinus

Bends--continued.
- Bromus tectorum var. glabratus
- Hordeum murinum
- Koeleria cristata
- Poa pratensis
- Scleropoa rigida

Myxomycetes

Physarum cinereum Pers. [2]
- Poa pratensis

Ascomycetes

Claviceps purpurea (Fr.) Tul.
- Agropyron caninum
- Agropyron desertorum
- Agropyron repens
- Agropyron semicostatum
- Agropyron sibiricum
- Agropyron smithii
- Agropyron striatum
- Bromus inermis
- Dactylis glomerata
- Elymus canadensis
- Lolium perenne

Erysiphe graminis DC.
- Agropyron repens
- Dactylis glomerata
- Elymus canadensis var. robustus
- Elymus dahuricus
- Poa palustris
- Poa pratensis

Phyllachora graminis (Pers.) Fckl.
- Agropyron cristatum
- Andropogon scoparius
- Elymus virginicus
- Hystrix patula

Fungi Imperfecti

Ascochyta agropyrina (Fair.) Tr.
- Agropyron sibiricum

Cercospora setaricola Tehon and Daniels
- Setaria lutescens

Colletotrichum graminicolum (Ces.) Wils.
- Agrostis alba
- Digitaria sanguinalis
- Millium effusum
- Trisetum flavescens

Darluca filum (Biv.) Cast
- With Puccinia coronata on:
  - Agropyron sibiricum

Darluca filum (Biv.) Cast--continued
- With Puccinia graminis on:
  - Agropyron inerme
  - Agropyron spicatum
  - Agropyron trachycaulum
  - Alopecurus pratensis
  - Beckmannia erucaeformis
  - Bromus arvensis
  - Dactylis glomerata
  - Deschampsia caespitosa
  - Elymus condensatus
  - Elymus glaucus
  - Festuca idahoensis
  - Hordeum bulbosum
  - Koeleria cristata
  - Phleum pratense

Darluca filum (Biv.) Cast--cont'd.
With Puccinia graminis on:
Poa ampla
Poa canbyi
Poa juncifolia
Poa nevadensis
Puccinellia distans

With Puccinia montanensis on:
Elymus canadensis
Elymus glaucus
Elymus sibiricus

With Puccinia poae-sudeticae on:
Poa pratensis

With Puccinia rubigo-vera on:
Agropyron repens
Agropyron trachycaulum
Elymus canadensis

Epicoccum sp.
Echinochloa crusgalli

Fusarium sp.
Aegilops crassa

Helminthosporium bromi Diedicke
Bromus carinatus
Bromus japonicus
Bromus marginatus
Bromus purgans

Helminthosporium tritici-repentis Died.
Agropyron repens

Helminthosporium vagans Drechs.
Poa pratensis

Helminthosporium spp.
Agropyron inerme
Bromus ciliatus
Bromus mollis
Holcus lanatus

Phleospora sp.
Agropyron repens
Elymus canadensis

Piricularia grisea (Cke.) Sacc.
Setaria lutescens
Setaria viridis

Scolecotrichum graminis Fckl.
Dactylis glomerata
Elymus canadensis
Phleum pratense
Poa compressa
Poa stenantha

Septoria elymi Ell. and Ev.
Elymus glaucus

Septoria macropoda var. septulata (Gz. Fr.) Spr.
Poa pratensis

Septoria nodorum Berk.
Agropyron smithii

Septoria oudemansii Sacc.
Poa pratensis

Stagonospora arenaria Sacc.
Agropyron trachycaulum
Dactylis glomerata
Elymus canadensis
Elymus virginicus

Stagonospora arrhenatheri Sm. and Ramsb.
Arrhenatherum elatius

Stagonospora bromi Sm. and Ramsb.
Bromus breviaristatus
Bromus carinatus
Bromus inermis
Bromus marginatus

Ustilaginales

Urocystis agropyri (Preuss) Schroet.
Poa pratensis

Ustilago bullata Berk.
Agropyron trachycaulum
Bromus catharticus
Bromus marginatus
Bromus polyanthus
Bromus purgans
Elymus canadensis

Ustilago neglecta Niessl
Setaria lutescens

Ustilago rabenhorstiana Kühn
Digitaria ischaemum

Sphacelotheca sorghi (Link) Clinton
Sorghum vulgare

Uredinales

Puccinia coronata Cda.
Agropyron sibiricum
Bromus arvensis
Bromus japonicus
Bromus macrostachys
Bromus marginatus
Bromus polyanthus
Bromus purgans
Bromus rubens
Elymus canadensis

Puccinia ellisiana Thüm.
Andropogon furcatus
Andropogon scoparius

Puccinia graminis Pers.
Agropyron inerme
Agropyron repens
Agropyron sibiricum
Agropyron spicatum
Agropyron striatum
Agropyron subsecundum
Agropyron trachycaulum
Agrostis scabra
Agrostis stolonifera
Alopecurus pratensis
Beckmannia erucaeformis
Bromus arvensis
Bromus breviaristatus
Bromus marginatus
Bromus vulgaris
Dactylis glomerata
Deschampsia caespitosa
Elymus condensatus
Elymus dahuricus
Elymus glaucus

Puccinia graminis Pers. -- continued
Elymus sibiricus
Elymus villosus
Elymus virginicus
Festuca idahoensis
Hordeum bulbosum
Hordeum jubatum
Hordeum jubatum var. caespitosum
Hordeum murinum
Hordeum nodosum
Koeleria cristata
Lolium perenne
Phleum pratense
Poa ampla
Poa arida
Poa canbyi
Poa compressa
Poa nevadensis
Puccinellia distans
Sitanion hystrix
Sitanion jubatum

Puccinia montanensis Ellis
Agropyron inerme
Agropyron spicatum
Agropyron subsecundum
Agropyron trachycaulum
Elymus canadensis
Elymus canadensis var. robustus
Elymus condensatus
Elymus glaucus
Lolium multiflorum

Puccinia poae-sudeticae (Westend.) Jørstad
Poa pratensis

Puccinia pygmaea Erikss.
Calamagrostis canadensis

Puccinia rubigo-vera (DC.) Wint.
Aegilops crassa
Aegilops triuncialis
Agropyron inerme
Agropyron repens
Agropyron sibiricum
Agropyron spicatum
Agropyron trachycaulum

Puccinia rubigo-vera (DC.) Wint.--continued
Agrostis alba
Agrostis palustris
Elymus canadensis
Elymus junceus
Elymus triticoides
Hordeum jubatum
Hystrix patula

Uromyces halstedii De-T.
Leersia oryzoides

Notes:
1/Bends refers to the disease discovered and described by Dr. G. W. Fischer, Phytopathology 31(7): 674-676, 1941. This disease was first reported for the Midwest by the writer, Plant Disease Reporter 25(4): 120-125, 1941.

2/*Physarum cinereum* caused a smothering of *Poa pratensis* in lawns resulting in complete killing of the current foliage in several small areas.
(UNIVERSITY OF MICHIGAN, DEPARTMENT OF BOTANY).

BRIEF NOTES ON PLANT DISEASES

PHYLLACHORA FUSICARPA IN FLORIDA: A specimen of *Duranta* leaves, species unknown, heavily infected by an immature *Phyllachora* was found in the vicinity of the Bok Tower at Lake Wales, Florida, on March 23, 1939 by D. R. Sumstine. Although immature, the fungus appears superficially to be identical with a mature specimen found in Haiti on *Duranta erecta* L. in 1925 by E. C. Leonard, identified as *Phyllachora fusicarpa* Seaver. This species was based upon specimens upon *Duranta repens* L. from Nassau in the Bahamas and from Rio Piedras in Puerto Rico described in 1920 in Britton & Millspaugh's Bahama Flora (p.633). A related species, *Phyllachora durantae* Rehm (Hedw. 31, p.306, 1892), described with much smaller ascospores than *P. fusicarpa*, is based on material from an unknown species of *Duranta* in Ecuador, but specimens are not available for comparison and that species appears to have been unrecognized since the original finding. It would seem likely that the Florida fungus may have been imported with the host from some West Indian source. (William W. Diehl, Division of Mycology and Disease Survey).

DESTRUCTIVE OCCURRENCE OF DIPLODIA ON OKRA STALKS IN ALABAMA: My assistant, who is working with fiber investigations, brought in a piece of okra stalk badly affected by the fungus *Diplodia natalensis* Pole Evans. The disease is so destructive that it has literally ruined the fiber, and discolored the interior as well. A large quantity of these stalks stacked outside are black with this fungus. I have never seen it so bad before. Evidently the okra stalks will have to be put in a dry place when cut to prevent damage to the fiber from this organism. (G. W. Carver, Tuskegee Institute, Alabama).

SPREAD OF WHITE PINE BLISTER RUST DURING 1941

Division of Plant Disease Control
Bureau of Entomology and Plant Quarantine

The spread of white pine blister rust [Cronartium ribicola] during 1941 was featured by a southward extension of the disease on Ribes from central Virginia and West Virginia into northern Tennessee and North Carolina, and by the finding for the first time of large numbers of cankers on sugar pine in northern California and southern Oregon in localities where Ribes were found infected in previous years.

In the Appalachinan region, the rust spread southward on wild Ribes for a distance of about 134 miles. Counties in which infection was found for the first time are Mercer, Monroe, Raleigh, and Summers in West Virginia; Bland, Giles, Grayson, Pulaski, Smyth, and Wythe in Virginia; Ashe, Avery, McDowell, and Wautauga in North Carolina and Carter and Johnson in Tennessee. In West Virginia there were 8 new centers of Ribes infection, in Virginia 8, in North Carolina 17, and in Tennessee 2, making a total of 35 in the 16 counties. The larger number of centers found in North Carolina probably is the result of more extensive scouting in that State to determine the southern limit of spread. Ribes americanum was found infected at 1 point, R. cynosbati at 19, and R. rotundifolium at 10. In Virginia, pine infections were found for the first time at 9 places in Bath County and 1 in Shenandoah County. Some of the new infections are within the boundaries of the purchase units of the Jefferson National Forest in Virginia, the Pisgah in North Carolina, and the Cherokee in Tennessee.

The southward extension of the rust was expected sooner or later and is not especially serious from a control standpoint, since nearly all of the valuable white pine stands within the newly infected counties already have been initially protected by the eradication of Ribes. This will prevent commercial damage to pine growing within control areas. In most cases the diseased Ribes were found outside the boundaries of control areas, and although white pines were growing nearby in some instances, they were too few and scattered to be of sufficient value to justify control work. Such individual trees or groups of trees are scattered throughout the white pine region of the Southern Appalachian States, and in these unprotected locations some damage and loss of white pine trees from blister rust is expected.

In the sugar pine region of Oregon and California many more blister rust cankers were discovered on sugar pines than have been observed in past years. In southern Oregon the wet season and the increase locally in the volume of aeciospore dispersal resulted in general and heavy infection on Ribes. The rust is now more or less generally present in Oregon in all counties where five-needle pines occur. A pronounced increase in the amount of disease on pines was observed in Josephine and Jackson Counties. In Klamath County infection was found for the first time on both pines and Ribes. Numerous infected sugar pines were located in parts of control units in the Siskiyou National Forest, notably around the Reuben Mountain area. Pine infections also were found this season just outside the Upper Rogue River and Pinehurst control units on the Rogue River National Forest.

The disease was found for the first time in Crater Lake National Park. Infection was confined to the Annie Creek Canyon and was found on both pines and Ribes. Sixteen cankers were located on 8 pines, 7 of them western white, and 1 sugar pine. A total of 150 Ribes were infected, distributed by species as follows: 72 Ribes inerme, 50 R. viscosissimum, 22 R. binominatum, 5 R. lacustre, and 1 R. cereum.

In California, blister rust infections were found for the first time on Ribes in Mendocino and Humboldt Counties in the Coast Range and in Sierra County in the Sierra Nevadas. The rust has thus spread southward in the Coast Range for some 200 miles and in the Sierra Nevada for 170 miles. There was heavy intensification and local spread within some northern counties where Ribes infection was previously very light. All pine infection found in California this year can be attributed to local origin. Ribes infections were limited to the general vicinity of "fruiting" cankers, except those in Mendocino and Humboldt Counties, which may represent spread from a longer distance, as locally white pines are not very plentiful.

Scouting in 1941 extended the known limit of rust spread 6 miles farther south, and the known limits of pine infection about 60 miles farther south in the Sierra Nevadas. In Plumas and Sierra Counties infection on Ribes was found close to the boundary of Yuba County.

Weather conditions on the Klamath National Forest in Siskiyou County were extremely favorable for the establishment and intensification of rust on Ribes. Also, cankers originating in 1937 were sporulating for the first time. As a result of these two conditions there was a general spread of rust in this forest. In view of the widespread and heavy infection on Ribes in the control unit near Hilt, California, the Ribes eradication in progress there was speeded up in order to lessen as much as possible the amount of infection that was returning from Ribes to young sugar pines. Rust intensification was particularly heavy on R. sanguineum. Nearly all bushes of this species were infected and the leaves were literally covered with rust.

Pine infection was discovered for the first time on the Shasta National Forest where 150 sugar pines were found with 603 cankers. The rust, although mostly restricted to stream type, was scattered throughout the Damnation Creek drainage in Shasta County. An interesting observation in this locality was the apparent high resistance to infection of R. roezli. This species, where it occurs in the Sierra Nevadas, is known to be highly susceptible, yet only 3 lightly infected R. roezli bushes out of hundreds examined were found in the Damnation Creek infection area, and these were in the immediate vicinity of sporulating cankers. Numerous infected R. nevadense were located.

On the Lassen National Forest 133 cankers on 80 sugar pines were located in the Montgomery Creek area, and 119 cankers on 73 pines in the Viola area. Only 2 cankers were noted on each of these 2 infection areas in 1940. A few fruiting cankers were found at Montgomery Creek but none at Viola.

The most significant find of the season was the discovery of infected sugar pine near Cascade in the southern end of the Plumas National Forest in Plumas County. Although one infected R. roezli had been located in this area

in 1938, no cankers had been found. In 1941, 28 infected pines containing 74 cankers were located in 4 townships, and rust on Ribes in 2 additional townships. The infected pines were all found along stream bottoms. A few cankers had sporulated, and the resultant Ribes infection was confined mostly to the same stream bottoms.

The discovery of rust on sugar pine so far south in the Sierra Nevadas and the large increase in the number of infected pines, is tangible evidence that the disease is beginning to establish itself over a wide area in northern California. The scouting in this part of the State resulted in the finding of a total of 929 cankers on 331 pines. Prior to this only 4 pines with 4 cankers had been discovered in the Sierra Nevada and Cascade Ranges in California. All pine cankers and all infected Ribes that were located during 1941 in the Sierra Nevada and Cascade Ranges were destroyed to retard the spread of the rust as much as possible.

The past year also appears to have been unusually favorable for rust intensification in the western white pine region of northeastern Washington, northern Idaho and northwestern Montana because of abnormally wet conditions throughout the growing season. Although there is enough pine infection present to cause considerable intensification of the disease every year, these particularly favorable years are apt to result in extensive and serious damage to young growth. This is especially true when numerous cankers formed during a previous wet year produce aeciospores in abundance during another wet year. This happened in 1941, when cankers from the heavy 1937 wave of pine infection reached the "fruiting" stage. As a result, infection was widespread on Ribes even where these bushes occurred in small numbers. The full effect of the exceptionally favorable conditions for rust spread during 1941 in this region cannot be definitely determined until 1943, but it is expected that a large increase in pine infection may take place. Infection on white pines was located for the first time in 1941 in Glacier National Park. Four cankers on 4 western white pine were found near the north end of Lake McDonald. This represents an eastward extension of the known location of pine infection although Ribes infection had been reported previously from Lake McDonald and other areas in Glacier National Park. The results of scouting in Yellowstone and Grand Teton National Parks were negative.

Blister rust infection in the North Central States was found for the first time on white pine in Wabash, Wadena, and Mahnomen Counties, Minnesota; Iron, Dane, and Richland Counties, Wisconsin; and Lake County, Michigan. The rust on either one or both host plants has been previously found in every county in Wisconsin and in all but 3 southern counties in Michigan. It was found on Ribes for the first time in Licking County, Ohio, and Wadena County, Minnesota. In general, weather conditions during the first part of the summer were unsatisfactory for the spread of the rust on Ribes, but after the middle of August they favored the spread of the disease on both host plants. Within the infected area, particularly in the northern part of the region where conditions are more favorable for rust development, there has been considerable recent intensification of the disease on white pine as shown by the number of cankers appearing on 1937 and 1938 wood. This area usually has more precipitation, lower temperatures, and more frequent fogs near the lakes than other parts of the North Central region. Also, there is a more general distribution of Ribes.

NEW BLISTER RUST INFECTIONS FOR 1941
(Infections listed are only those found for the first time in a new county on either pines or Ribes, or both)

Region and State	County	Host Plant: Ribes	Host Plant: Pine	Species	Date
So. Appalachian					
Virginia	Bath		X	Pinus strobus	May
	Bland	X		R. rotundifolium	Sept.
	Giles	X		"	"
	Grayson	X		R. cynosbati	Oct.
	Pulaski	X		R. rotundifolium	Sept.
	Shenandoah		X	P. strobus	May
	Smyth	X		R. cynosbati	Oct.
	Wythe	X		R. rotundifolium	Sept.
West Virginia	Mercer	X		R. cynosbati	Sept.
	Summers	X		"	"
	Monroe	X		"	"
	Raleigh	X		"	Oct.
Tennessee	Carter	X		"	Oct.
	Johnson	X		"	"
North Carolina	Ashe	X		R. cynosbati & amer.	"
	Avery	X		R. rotundifolium	"
	McDowell	X		"	"
	Watauga	X		R. cynosbati	"
North Central					
Minnesota	Wadena		X	P. strobus	Sept.
	Wadena	X		R. cynosbati	"
	Wabasha		X	P. strobus	June
	Mahnomen		X	P. strobus	Aug.
Michigan	Lake		X	"	Dec.
Ohio	Licking	X		R. cynosbati	Sept.
Wisconsin	Iron		X	P. strobus	June
	Dane		X	"	Nov.
	Richland		X	"	Dec.
Sugar Pine:					
California	Mendocino	X		R. menziesii	Dec.
	Humboldt	X		"	"
	Sierra	X		R. roezli	Sept.
	Klamath	X	X	5 Ribes species	"
	Klamath		X	P. lambertiana	Sept.

Blister rust has been prevalent throughout the Northeastern States for many years. The progress of Ribes eradication since 1918 has brought the rust under control over extensive areas where these bushes have been removed and kept suppressed. In 1941 Ribes in general were from moderately to heavily infected in spite of drought conditions which prevailed during most of the field season. A few new pine infection centers were found in some of the States, but these were areas where the disease had been present for several years. The number of new cankers appearing on the pines in protected areas is small. Old infection on white pines is conspicuous in many places, but in most of these areas Ribes have been kept suppressed and therefore new infection is absent.

A tabular statement showing by States the counties in which blister rust on pine and Ribes were found for the first time in 1941 is given on page 79.

JANUARY WEATHER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending February 3, 1942.

The weather during January was decidedly abnormal in several respects. Instead of the usual alternating brief periods of relatively cold and warm weather, characteristic of the winter season, nearly the entire first half of the month was persistently cold and the last half abnormally warm. Much of the last 2 weeks of the period was spring-like over large areas of the country.

The cold weather during the first half of the month was unusually severe, with subzero temperatures prevailing everywhere from the Appalachian Mountains westward to the Rockies and reaching as far south as central Virginia, western North Carolina and central Tennessee. A hard freeze penetrated the deep South with minimum temperatures as low as 16° reported from northern Florida.

With the reaction to higher temperatures about the middle of the month the subsequent weather was just as persistently warm with temperatures for 2 weeks in succession averaging from 20° to nearly 30° above normal in considerable northwestern areas. However, the Great Basin of the West experienced subnormal temperatures during nearly the entire month. Precipitation was decidedly scanty in most sections of the country.

Figure 1 shows that the average temperature for the month as a whole was substantially normal from the Appalachian Mountains eastward and decidedly above normal from the Ohio and lower Missouri Valleys and southern Great Plains northward and northwestward. In most of this latter area the monthly means were from 3° to as many as 16° above normal.

On the other hand it was colder than normal from Kentucky and southern Missouri southward and southwestward, and also in central and northern Rocky Mountain sections and the Great Basin of the West. The minus anomalies were substantial in the northern Rocky Mountain area and the northern Great Basin. In the Northwest, there were some striking contrasts in the mean monthly temperatures in contiguous localities. For example, the average at Havre, Montana was 11° above normal and at Helena, Montana 10° below normal.

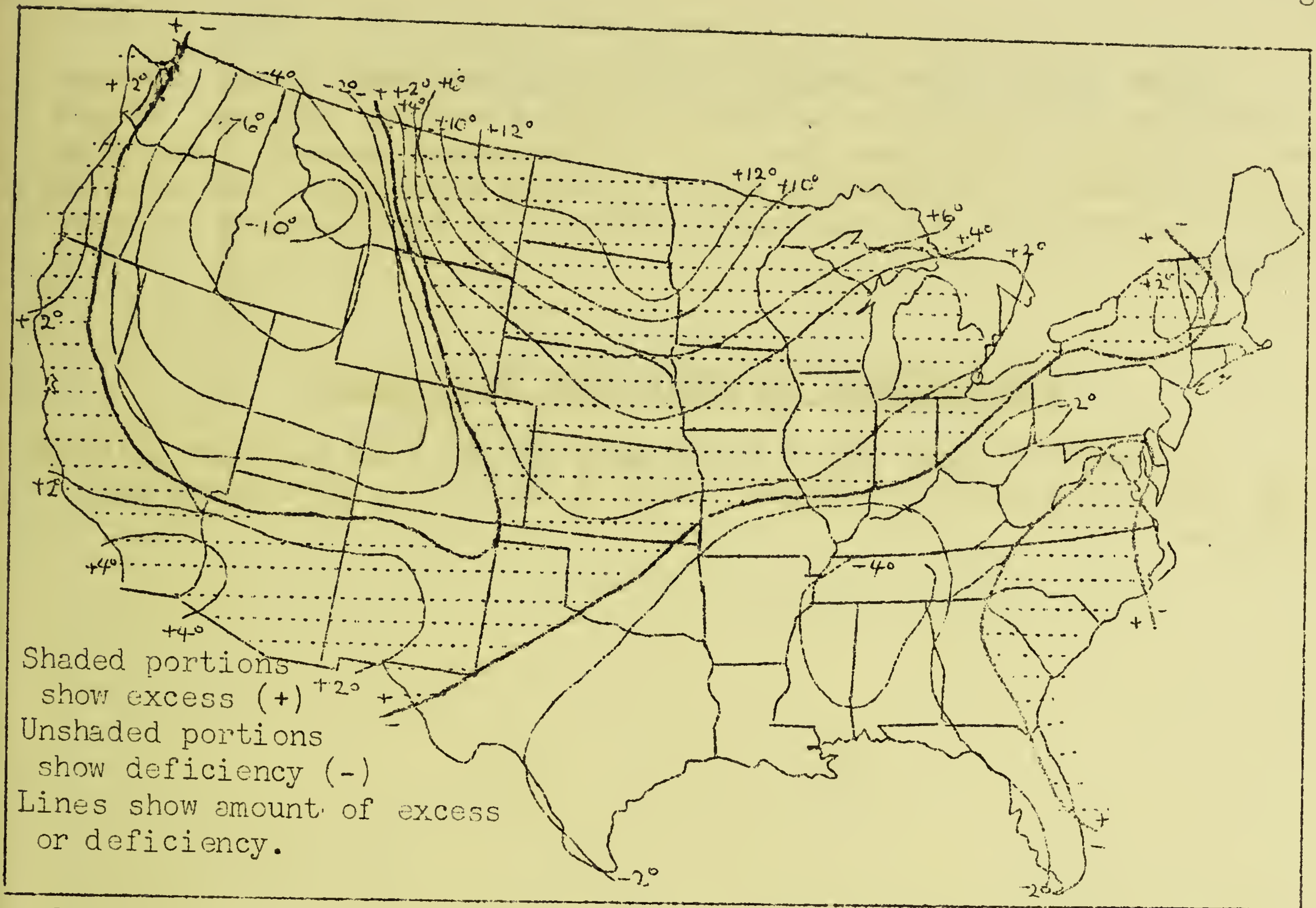

Fig. 1. -- Departure of Mean Temperature from the Normal for January 1942.

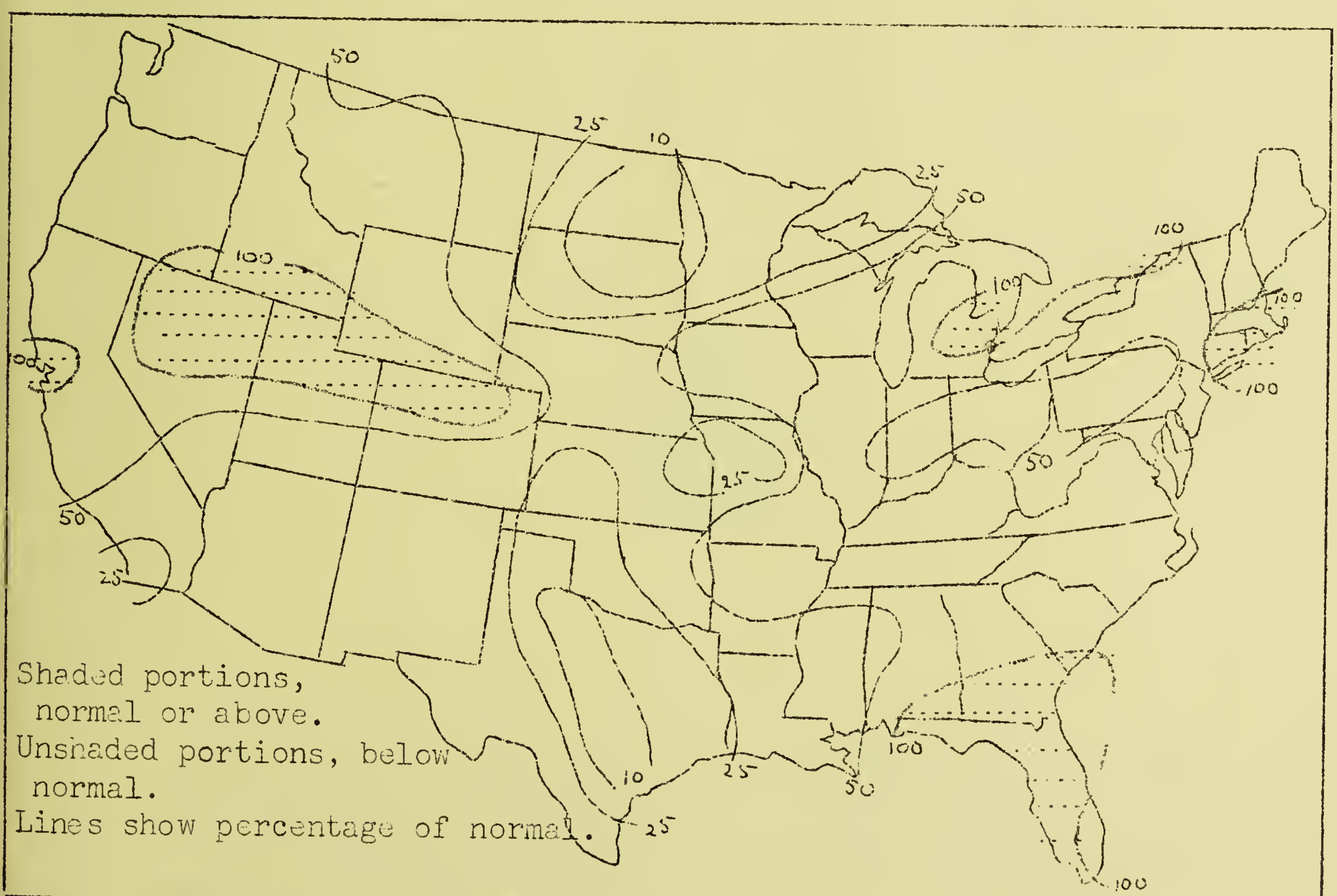

Fig. 2. -- Percentage of Normal Precipitation for January 1942.

Figure 2 shows that precipitation was above normal in the extreme Southeast and locally in the Northeast and more western sections. Otherwise, the monthly totals were generally below normal, markedly so in most sections between the Mississippi River and Rocky Mountains. A considerable area of the Southwest had less than one-fourth the normal amount of precipitation.

A CORRECTION: NO PHONY PEACH IN OKLAHOMA

The report on page 298 of Supplement 128 of phony peach in Oklahoma is an error and should be deleted. Phony peach has not been found in Oklahoma.

THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXVI Number IV

March 1, 1942

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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Volume XXVI March 1, 1942 Number 4

IN THIS ISSUE

Check list revision, by Freeman Weiss, page 84.

The first recorded occurrence of potato late blight in Colorado, reported by W. A. Kreutzer and John G. McLean, page 91, demonstrates again that plant disease distribution depends on the coincidence of host, inoculum, favorable weather, and other necessary conditions.

Earlier favorable conditions for the development of certain pea diseases in the Palouse section of Idaho in 1941 were ended by late summer dry weather and only minor damage resulted, according to W. J. Virgin, page 91.

In response to the suggestion made by O. H. Elmer in an earlier number of the Reporter, R. W. Leukel contributes a brief report on the results from the use of Spergon in an experiment for the control of sorghum diseases, page 93.

Phony Peach: A further correction, page 94.

CHECK LIST REVISION

Freeman Weiss

QUERCUS (FAGACEAE)

QUERCUS spp. Occurring on various or undetermined spp.

Aleurodiscus oakesii (Berk. & Curt.) Cke., smooth patch, white patch. Pa. to Va. & Mo. Other spp. also reported on bark include A. acerinus (Pers.) Höhn. & Litsch. and A. candidus (Schw.) Burt, New England to Fla. & Texas; A. cerassatus (Bres.) Höhn. & Litsch., S. Dak.; A. griseo-canus (Bres.) Höhn. & Litsch., Iowa, Mo.
Armillaria mellea Vahl ex Fr., root rot, butt rot. General.
Ascochyta quercus Sacc. & Speg., on leaves. Wis.
A. quercuum (Cke.) Sacc. Ga.
Ascomycetella floridana Ell., on leaves. Fla.
Asterina spp., black spot (superficial) on living leaves. Gulf States., Calif.
Boletus spp., associated with mycorhiza, possibly sometimes parasitic on roots. Cosmopolitan.
Botryosphaeria spp., on twigs & branches, saprophytic, or weakly parasitic causing dieback & cankers. Collections and reports in the U.S. as B. berengeriana DeNot. or B. fuliginosa (Moug. & Nestl.) Ell. & Ev. are Physalospora obtusa (Schw.) Cke.; B. melanops (Tul.) Wint., on Q. borealis in Conn.; B. quercuum (Schw. ex Fr.) Sacc., Mass. to Ga. and Mo.; B. ribis (Tode ex Fr.) Gross. & Dug. and its var. chromogena Shear et al., Mass. to Fla. & Miss.
Bulgaria inquinans Pers. ex Fr. (B. polymorpha Wettst., Phaeobulgaria i. Nannf.), on bark of branches & trunks. Widespread. Associated with trunk canker, Ill., N.Y.
Clitocybe tabescens (Scop. ex Fr.) Bres. (C. monadelpha (Morg.) Sacc.), root and butt rot. Va. to Mo. and southward.
Coccomyces coronatus (Schum. ex Fr.) DeNot. on fallen leaves. Widespread.
C. triangularis (Schw.) Sacc., twig canker & dieback. Eastern States to La. & Mich.
Colpoma quercinum (Pers. ex Fr.) Wallr. (Clithris quercina Pers. ex Rehm), on twigs. Ga.
Coniophora puteana (Schum. ex Fr.) Karst., wood rot (logs & timber). Occasional.
Coniothyrium sp. (? C. truncisedum Vestergr.), on twigs, ? dieback. Ill.
Cookella quercina Pk., on leaves. Ill.
Corticium lividum Pers. ex Fr., sprout butt rot. Eastern States to La. (Numerous other spp. reported on dead wood.)
Coryneum kunzei Corda, twig & branch canker, dieback. Conidial stage of Pseudovalsa longipes.
(Cronartium cerebrum Hedgc. & Long): C. quercuum.

C. conigenum Hedgc. & Hunt, rust (II, III). On Q. emoryi and Q. hypoleuca, Ariz. O and I on Pinus leiophylla.
C. fusiforme Hedgc. & Hunt, rust (II,III). On Q. nigra, Q. phellos & others. Ala., Fla., Ohio. O and I on Pinus caribaea, P. serotina and P. taeda.
C. quercuum (Berk.) Miyabe, rust (II, III). On various Quercus spp., sometimes perpetuating in the II stage on evergreen oaks. Widespread, especially in the S.E. States and Calif. O, I on 2- and 3-needle pines.
C. strobilinum Hedgc. & Hahn, rust (II,III). On Q. virginiana, Q. geminata & others. Fla. O and I on Pinus caribaea and P. palustris.
Cryptostictis glandicola (Schw.) Starb., on acorns. Pa.
Cuscuta exaltata Engelm., dodder, on seedlings. Texas.
Cylindrosporium microspilum Sacc. & Wint., leaf spot. Mo.
C. quercinum Carter, on branches, ? dieback. Ill.
C. quercus Sorok., leaf spot. Ohio
Cytospora spp. (? C. chrysosperma Pers. ex Fr., C. intermedia Sacc., C. pallida Ell. & Ev.), twig canker, dieback. Conidial stage of Valsa spp.
Daedalea spp., wood rot, usually white rot of sapwood, sometimes on living trees. D. ambigua Berk., Va. to Mo. & southward; D. confragosa Bolt. ex Fr., N.Y. to N. Car. & La.; D. farinacea (Fr.) Overh., La., S.Car.; D. unicolor Bull. ex Fr., N.E. and Central States.
D. quercina L. ex Fr., butt rot, brown cubical heart rot, timber rot. General.
Daldinia spp., white streaked sapwood rot of logs & slash. Cosmopolitan. D. concentrica (Bolt. ex Fr.) Ces. & DeNot., D. occidentale Child, D. vernicosa (Schw.) Ces. & DeNot.
Diaporthe leiphaemia (Fr.) Sacc. var. raveneliana (Thüm. & Rehm) Wehmeyer, twig canker, dieback. Mass. to Fla. & Iowa.
Diatrype spp., especially D. stigma Hoffm. ex Fr., on branches, ? canker. Va. to Ala., Texas & Ill.
Diatrypella quercina (Pers. ex Fr.) Nits., on branches. Widespread.
Dichaena quercina Pers. ex Fr., bark canker. Ala., N.J., Texas.
Diplodia spp., twig canker, dieback. Chiefly D. longispora Cke. & Ell. (conidial stage of Physalospora obtusa ?) on Q. prinus & Q. alba; others, perhaps related to other Physalospora spp., on twigs, acorns and leaf galls.
Dothiorella quercina (Cke. & Ell.) Sacc., branch canker. Conn. to N.J. & Ill. Conidial stage of Physalospora glandicola.
Endothia spp., on bark of branches & exposed roots. Chiefly saprophytic are E. fluens (Sow.) Shear & Stevens, occurring from Pa. to N.Car. & Tenn.; its var. mississippiensis Shear & Stevens in Ky., Miss. & Tenn.; and E. singularis (H. & P. Syd.) Shear & Stevens, in Colo. & N. Mex. E. gyrosa (Schw.) Fr., occurring from Md. to Fla., Ind., Texas & Calif., and E. parasitica (Murr.) P.J. & H.W. And., reported on Quercus spp. in Mass., Pa. & Md. are sometimes parasitic.

QUERCUS - continued

Erysiphe trina Harkn., powdery mildew. On Q. agrifolia, Calif.
Favolus alveolaris(DC. ex Fr.) Quél., white sapwood rot of logs & slash. N.E. and Central States.
Fistulina hepatica Huds. ex Fr., brown cubical heart rot (brown oak, foxiness), sprout butt rot. Eastern & Central States.
Fomes applanatus (Pers. ex Fr.) Gill., root & butt rot, white mottled heart rot. General.
F. everhartii (Ell. & Gall.) Schrenk, trunk canker, white or yellow flaky heart rot, often on living trees. Eastern and Central States, Mont.
F. fomentarius (L. ex Fr.) Kickx, white mottled sapwood & heart rot, sometimes on living trees. N.E. and Central States.
F. igniarius (L. ex Fr.) Kickx, white mottled heart rot. Eastern and Central States to Okla. Var. laevigatus (Fr.) Overh., La.
F. lobatus (Schw.) Cke., white spongy rot. N.Car. to Ark. & La.
F. robustus Karst., white heart rot. Ohio, Pa., Va.
Fomes spp., wood rot. Other spp. reported on trunks, logs & branches, sometimes causing butt or heart rot, include F. calkinsii (Murr.) Sacc. & D. Sacc., W.Va. to N.Car. & La.; F. connatus (Weinm. ex Fr.) Gill., Va.; F. geotropus Cke., La., Miss.; F. marmoratus (Berk. & Curt.) Cke., Calif., Fla., Texas; F. ohiensis (Berk.) Murr., Va.
Fomitiporia spp., wood rot of dead standing trees & logs. Southern States. Spp. reported include F. dryophila Murr., F. earleae Murr., and F. flavomarginata Murr.
Fusicoccum sp. (F. ellisianum Sacc. & Syd.?), branch canker. Md., Ill. Conidial stage of Diaporthe sp. ?)
Ganoderma curtisii (Berk.) Murr., root & butt rot, white heart rot. Md. to Fla. & Texas.
G. lucidum (Leyss. ex Fr.) Karst., white heart rot. Pa. to N.Car. & La.
Geotrichum sp., pink wood stain. Southern States.
Gloeosporium canadense Ell. & Ev. and G. nervisequum Fckl. (In U.S. reports considered the conidial stage of Gnomonia veneta, but in Europe identified on Quercus as G. quercinum Westl. and considered distinct from the sp. on Platanus.)
G. quernum Harkn., shoot blight. On Q. agrifolia, Calif.
G. septorioides Sacc. (Marsonia quercina Wint.) Leaf spot. Mo.; and var. major Ell. & Ev., N.J.
Gnomonia veneta (Sacc. & Speg.) Kleb., anthracnose, leaf blight. Chiefly on Q. alba; general east of Great Plains, also Calif.
Godroniopsis quernea (Schw.) Diehl & Cash, on branches, ? canker. Conn. to Fla. & Mo.
Hydnum erinaceus Bull. ex Fr., butt rot, white spongy heart & sapwood rot, often on living trees. Eastern and Central States. Other spp. reported as causing decay, sometimes of living trees are H. laeticolor Berk. & Curt., H. ochraceum Pers. ex Fr., and H. pulcherrimum Berk. & Curt.

Hymenochaete rubiginosa (Dicks. ex Fr.) Lév., white pocket rot of logs & timber. Eastern States. Other spp. reported as causing decay are H. corrugata (Fr.) Lév., H. curtisii (Berk.) Morg., and H. sallei Berk. & Curt.

Hypoderma ilicinum DeNot., on leaves of evergreen oaks. Gulf States.

Irpex spp., wood rot, chiefly logs & branches. I. lacteus Fr., I. obliquus Schrad. ex Fr., and I. pachyodon Pers., among others, are reported as causing decay.

Lentinus tigrinus Bull. ex Fr., sprout butt rot. La., Miss. Other spp. reported on dead wood.

Lenzites betulina L. ex Fr., white sapwood rot of logs & timber. Widespread. Likewise L. trabea Pers. ex Fr. and L. vialis Pk., occasional.

Leptothyrium dryinum Sacc., on leaves. Eastern States to Wis. & Texas.

Macrophoma dryina (Berk. & Curt.) Berl. & Vogl. (Sphaeropsis dryina Berk. & Curt.), on branches. Ill., Pa. (Conidial stage of Physalospora sp. ?)

M. nervicola Ell. & Ev., on leaves. Okla., Wis.

Marssonina martinii (Sacc. & Ell.) P. Magn., leaf spot. Conn. to Gulf States, Kans. & Wis.

M. quercus (Pk.) P. Magn., Ind., Mo., N.Y., Texas. A fungus described as Marssonia quercina Wint. in Mo., was subsequently considered a synonym of Gloeosporium septorioides and more recently reported again under this name in Pa. as M. quercina Wint. var. major Ell. & Ev.

Merulius incarnatus Schw. and M. tremellosus Schrad. ex Fr., wood rot. Eastern States.

Microsphaera alni DC. ex Wint. (M. quercina (Schw.) Burr.) and M. alni var. extensa (Cke. & Pk.) Salm., powdery mildew. (Usually on coppice and nursery plants. The var. extensa is reported chiefly in the Eastern and S. E. States, but often is not distinguished; the var. calocladophora (Atk.) Salm. on Q. laurifolia and Q. nigra also is considered distinct by some authorities.)

Monochaetia desmazierii Sacc., large leaf spot. Mass. to S.Car.&Tenn., Calif.

M. taphrinicola (Ell. & Ev.) Sacc., on Taphrina spots. Pa.

Morenoella quercina (Ell. & Mart.) Theiss., black leaf spot. Va. to Fla. & Texas.

Mycosphaerella spp., chiefly on fallen leaves. Those reported include M. aquatica (Cke.) Miller, Ga.; M. catesbeyi (Cke.) Miller, Ga.; M. nigrita (Cke.) Miller, Ga.; M. maculiformis (Pers. ex Fr.) Schroet., and M. punctiformis (Pers. ex Fr.) Schroet., Eastern and S. E. States; M. spleniata (Cke. & Pk.) House, Ga., N.Y.

Myriangium duriaei Mont. & Berk., on scale-infested branches. N.Car.

Nectria cinnabarina Tode ex Fr., on twigs & branches, ? canker. Widespread.

N. coccinea Pers. ex Fr. (N. ditissima Tul. ?), branch & trunk canker. N. E. States.

N. galligena Bres., trunk canker. Oregon.

QUERCUS -- continued.

Nigrospora sphaerica (Sacc.) Mason, twig blight ? Ill.
Nummularia clypeus (Schw.) Cke., on branches. Eastern & Southern States. Canker & dieback, Ill.
Oidium sp., witches'-broom. Calif. (See also Microsphaera and Phyllactinia.)
Pestalotia (Pestalozzia) spp., ? leaf spot. Spp. reported on green or partly green leaves include P. clavispora Atk., Ala.; P. montellica Sacc. & Vogl., Pa.; P. nervalis Ell. & Ev., Wis. Other spp. on fallen leaves.
Pezizella oenotherae (Cke. & Ell.) Sacc., on twigs & fallen leaves. Va.
Pholiota sp., sprout butt rot. Pa., Va.
Phoma spp. (P. aposphaerioides Briard & Hariot and P. quercina (Pk.) Sacc.), twig & branch canker. N.Y.
Phomopsis sp., trunk & branch galls. Md., Va., Texas.
P. quercina (Sacc.) Höhn., dieback & canker. Ill.
Phoradendron flavescens (Pursh) Nutt., mistletoe. N.J. to Mo. and southward.
P. engelmanni Trel. Texas.
P. longispicum Trel. Ariz., Calif.
P. villosum Nutt. Calif., Oregon.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Eastern & Central States, Calif.
Phyllosticta agrifolia Ell. & Ev., leaf spot. On live oaks. Calif.
P. livida Ell. & Ev. On various spp. Widespread.
P. ludoviciana Ell. & Mart. On Q. nigra. Fla., La.
P. phomiformis Sacc. On white and chestnut oaks. Eastern States to Fla., Kans. & Wis.
P. quercus Sacc. & Speg. On Q. macrocarpa. Ind., N.Y., Wis.
P. quercus-ilicis Sacc. On Q. virginiana. Miss.
P. quercus-prini Ell. & Ev. On Q. prinus. W.Va.
P. tumoricola Pk. On Q. alba. N.Y.
P. vesicatoria Thüm. On Q. brevifolia. S.Car.
P. virens Ell. & Langl. On Q. virginiana. La.
P. wislizeni Ell. & Ev. On Q. wislizeni. Calif.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora spp., on twigs & branches sometimes causing dieback & canker. Usually reported in conidial stage as Diplodia, Dothiorella or Sphaeropsis.
P. fusca N. E. Stevens. N.Y. to Fla., La. & Ohio
P. glandicola (Schw.) N.E. Stevens. Conn. to Md., Mich., & Ill.
P. obtusa (Schw.) Cke. N.Y. to Fla., La. & Ill.
P. rhodina (Berk. & Curt.) Cke. Va. to Fla., Iowa.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Md., Mich.
Phytophthora cactorum (Leb. & Cohn) Schroet., bleeding canker. Calif., Fla., N.Car.
Pleurotus ostreatus Jacq. ex Fr., sapwood rot, sprout butt rot. Eastern and Central to Gulf States. P. ulmarius Bull. ex Fr., P. petalloides Bull., P. spathulatus (Fr.) Pk. also reported as causing decay.

QUERCUS -- continued.

Polyporus berkeleyi Fr., string & ray butt rot. Eastern States to N.Car. & Ark.

P. croceus Pers. ex Fr., white pocket butt rot. Eastern & Central to Gulf States.

P. dryadeus Fr., white root & butt rot. Eastern & Central States to Texas.

P. dryophilus Berk. (P. rheades Pers. ex Fr.), white pocket heart rot. Widespread, including the S.W. and Pacific Coast States.

P. frondosus Dicks. ex Fr., straw-colored spongy butt rot. N.E. and Central States to La.

P. hispidus Bull. ex Fr., trunk canker, white spongy heart rot, Pa. to Fla. & La.

P. obtusus Berk., white spongy heart rot, commonly on living trees. Md. to Ga. & La., Minn.

P. spraguei Berk. & Curt., brown crumbly root & butt rot. Eastern & Central States to La.

P. sulphureus Bull. ex Fr., and var. cincinnatus (Morgan) Overh., root & butt rot, brown cubical heart rot. Eastern & Central States to Ga. & Texas.

Polyporus spp. Others reported usually on dead wood, sometimes causing sapwood (wound) rot, sprout butt rot, or heart rot, include: P. abietinus Dicks. ex Fr., Calif.; P. admirabilis Pk., Pa.; P. adustus Willd. ex Fr., widespread; P. arcularius Batsch ex Fr., Pa., N. Car.; P. biformis (Klotzsch) Berk., widespread; P. caesius Schrad. ex Fr., Appalachian region; P. cinnabarinus Jacq. ex Fr., widespread; P. cinnamomeus Jacq. ex Fr., N.Y., N.Car.; P. compactus Overh., Pa., Va.; P. cuticularis Bull. ex Fr., Pa. to Ark. & La.; P. delectans Pk., Pa., Va.; P. dichrous Fr., Va. to La.; P. fissilis Berk., La.; P. galactinus Berk., Pa. to Tenn. & La.; P. giganteus (Pers. ex Fr.), Pa., La.; P. gilvus (Schw.) Fr., widespread; P. graveolens (Schw.) Fr., Ohio, N.Car.; P. hirsutus Wulf. ex Fr., widespread; P. lacteus Fr., Md., N.Y., S.Dak.; P. pargamenus Fr., widespread; P. ludovicianus (Pat.) Sacc. & Trott., S. Car. to Fla. & La.; P. poculus (Schw.) Berk. & Curt., Ohio, Pa., S. Car.; P. sanguineus L. ex Fr., Va. to Fla. & La.; P. sector Ehr. ex Fr., Ga. to Fla. & Texas; P. spumeus Sow. ex Fr., La., Md.; P. squamosus Huds. ex Fr., Conn.; P. unitus Pers., widespread; P. tulipiferus (Schw.) Overh., widespread; P. versicolor L. ex Fr., widespread; P. zonalis Berk., La., Miss.

Poria spp., wood rot, chiefly of logs & branches, sometimes heart rot of living trees, occasionally on timber. Spp. reported include P. ambigua Bres., Southern States; P. andersonii (Ell. & Ev.) Neuman, heart rot, Pa. to N.Car., Ark. & Calif.; P. cocos (Schw. ex Fr.) Wolf, root rot, butt rot, S.E. States; P. incrassata (Berk. & Curt.) Burt, timber rot, Southern States; P. nigra Berk., Eastern States to Fla. & Wis.; P. punctata Fr., Eastern States to Mo. & Wis.; P. subacida (Pk.) Sacc., Eastern States; P. versipora Pers. ex Romell, widespread; and others.

QUERCUS -- continued.

Pseudovalsa longipes (Tul.) Sacc. (Coryneum kunzei Cda.), twig & branch canker. Mass. to Va., Texas & Iowa.

Pyrenochaeta minuta Carter, on twigs, ? canker. Ill.

Rhodosticta quercina Carter, branch canker. Ill.

Schizophyllum commune Fr., wood rot. Occasional.

Septobasidium spp., on scale insect-infested branches. Spp. reported include S. canescens Burt, Calif.; S. cokeri Couch, S. curtisii (Berk. & Desm.) Boed. & Stein., S. fuscum Couch, S. pseudopedicellatum Burt, S. retiforme (Berk. & Curt.) Pat., S. rugulosum Couch, S. sinuosum Couch, S. tenue Couch, in S.E. and Gulf States.

Septoria dryina Cke., leaf spot. Kans., Mass., S.Car.

S. neglecta Earle. Ala., Minn.

Sphaerognomonia polystigma (Ell. & Ev.) Thompson & Miller, on leaves. Ga., La.

Sphaeropsis spp., dieback, canker. Conidial stages of Physalospora, as S. gallae (Schw.) Berk. & Curt. and S. quercina Cke. & Ell. = P. glandicola; S. malorum Pk. = P. obtusa; S. quercinum Cke. & Harkn. (an illegitimate name) is reported from Calif. & Ill.

Sphaerotheca lanestris Harkn., brown mildew. Central & Southern States, Calif.

Stereum frustulosum Pers. ex Fr., sprout butt rot, white pocket heart rot. N. E. and N. Central to Gulf States, Oregon.

S. gausapatum Fr., sprout butt rot, white pocket heart rot. N. E. and Central to Gulf States.

S. murrayi (Berk. & Curt.) Burt, white pocket heart rot. Eastern & Central States.

S. subpileatum Berk. & Curt., butt rot, white pocket heart rot. Pa. to Mo. & Gulf States.

Stereum spp. Others reported causing decay, chiefly of logs, branches, & timber include S. fasciatum Schw., S.E. to Central & Gulf States; S. fuscum Schrad. ex Quél., widespread; S. hirsutum Willd. ex Fr., widespread; S. lobatum (Kze.) Fr., Md., N.Car., Texas; S. rameale Schw., widespread; S. rugosum Pers. ex Fr., N.Y., N.Car.; S. sericeum Schw., Ind., N.Car., Pa.; S. umbrinum Berk. & Curt., Southern States.

Strumella coryneoidia Sacc. & Wint., trunk canker. N.E. States to Va., Mo., & Minn.; Oregon.

Taphrina coerulescens (Desm. & Mont.) Tul., leaf blister. General except the far West; most injurious in the South.

Trabutia erythrospora (Berk. & Curt.) Cke., black leaf spot. Calif., Texas.

T. quercina (Fr. & Rud.) Sacc. & Roum., N.Car. to Fla. & Miss.

Trametes spp., wood rot, chiefly of logs & timber. Spp. reported include T. hispida Bagl., S.Dak.; T. rigida Berk. & Mont., Southern States; T. sepium Berk., N.J. to Ill. and southward.

Ustulina vulgaris Tul., wood rot (logs & stumps), sometimes causing sprout butt rot in Eastern States.

QUERCUS -- continued.

Valsa intermedia Nits., dieback, canker. Ill.
Venturia asterinoides Ell. & Mart., on leaves. Fla., Ga.
V. orbicula (Schw.) Cke. & Pk., on leaves. N.J., N.Y., Kans.
Chlorosis -- physiological, usually iron deficiency. Occurs especially in pin oaks planted as lawn and street trees. N.E. and N. Central States.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

FIRST REPORT OF LATE BLIGHT OF POTATO IN COLORADO

W. A. Kreutzer and John G. McLean

Late blight of potato (Phytophthora infestans) was found in the irrigated region of northern Colorado during the season of 1941. To the best of the writers' knowledge this is the first recorded instance of the occurrence of this disease in Colorado. The disease was first found occurring in storage; in a few instances it was causing considerable damage. Most of the cellars examined showed no infected tubers. Of 20 cellars showing infection, the majority showed a trace to 0.5 percent of the disease. One seed lot contained 1 percent of infected material, and two seed lots showed almost 25 percent of the trouble. In the latter instance the tubers were grown from seed obtained from the Lake States region.

Weather conditions during the growing season in Colorado ordinarily do not favor the appearance and spread of late blight. Although the average temperatures are well within the range in which P. infestans will develop, relatively low rainfall, low humidities, and a large number of clear days during the growing season prevent the epiphytotic occurrence of the disease. Conditions during the season of 1941, however, were more favorable for the development of the malady. Rainfall was above normal, and there was an unusually large number of cloudy and partially cloudy days. Frequently on such days there was light rainfall accompanied by lowered temperatures.

Although weather conditions similar to 1941 would not be expected normally in future years, precautionary measures are being taken to prevent the use of infected seed whether grown locally or obtained from outside sources.

(COLORADO AGRICULTURAL EXPERIMENT STATION).

PREVALENCE OF CERTAIN PEA DISEASES IN THE PALOUSE SECTION OF IDAHO IN 1941

W. J. Virgin

Since their appears to be some concern among various seedsmen and plant pathologists in regard to the prevalence of certain pea diseases in Western growing areas, a note concerning pea diseases in the Palouse area of Idaho seems appropriate at this time.

The early part of the growing season of 1941 was unusually wet as compared with the average for 47 years (1892 - 1938). Examination of the accompanying graph (Fig. 1) illustrates the fact that the precipitation was heavy in April, May, and June, whereas only 0.3 of an inch of rain fell in July and only 0.8 of an inch in August. Because of the abundant rains in May and June peas made a heavy vine growth. Inspection of fields in the fore part of July revealed the presence of Mycosphaerella blight (*Mycosphaerella pinodes*), leaf blotch (*Septoria pisi*), and

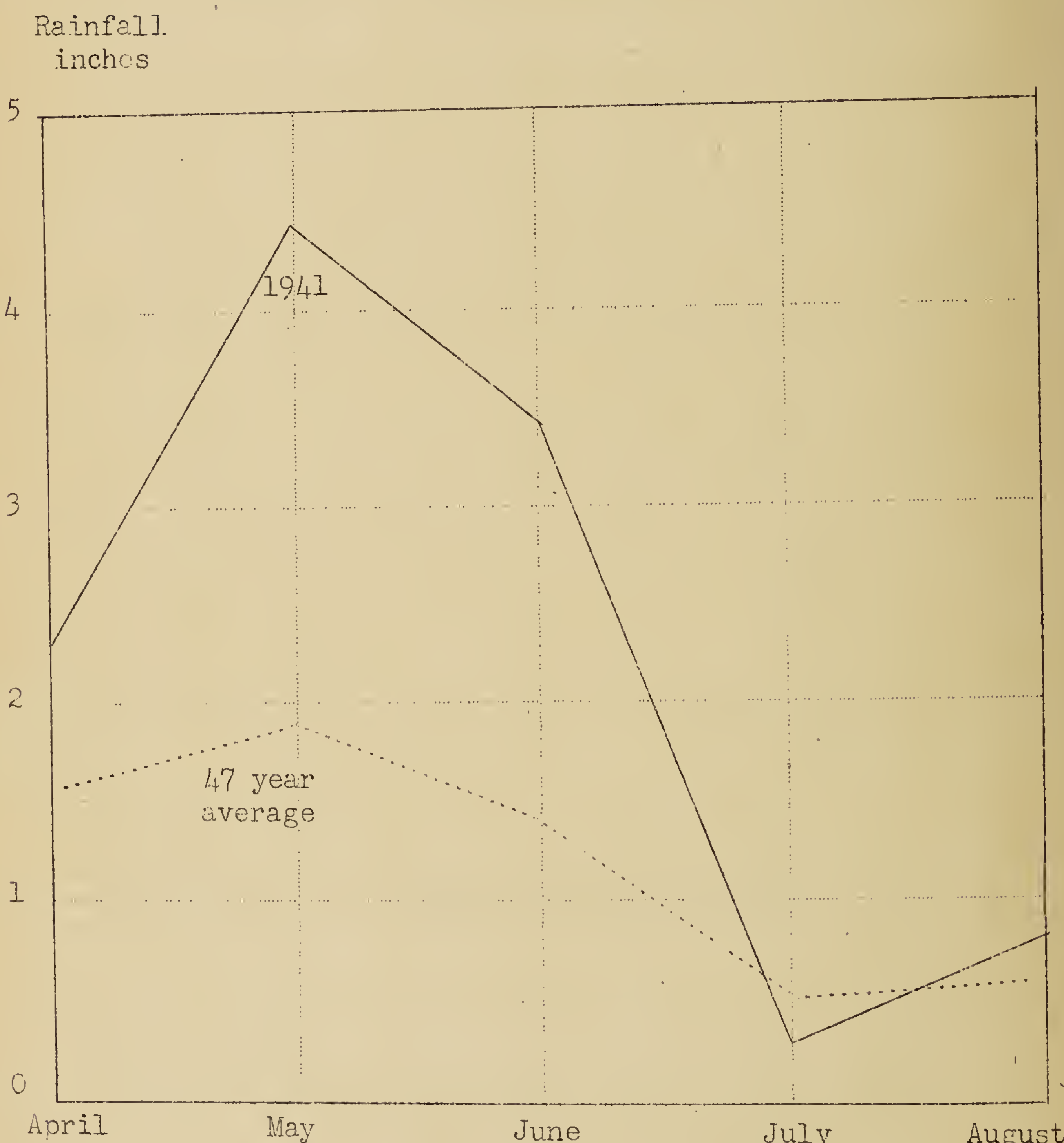

Fig. 1 -- Rainfall of 1941 pea growing season compared with the 47 year average. Note rainfall in July and August was about normal.

bacterial blight (Bacterium [Phytomonas] pisi) on the lower leaves of plants in a few of the fields. These same fields were examined about three weeks later and these diseases were still found confined to the lower leaves. Apparently the dry weather in July and August held them in check. In addition to these three diseases, pea rust (Uromyces fabae) was found in one field in the last examination. Both the uredinial and aecial stages were present on the basal leaves of the pea plants.

It appears that these diseases played a minor role and did little damage. Undoubtedly if the heavy rains had continued through July and August, these diseases would have spread and caused considerable pod and seed infection. Fortunately this was not the case.
(UNIVERSITY OF IDAHO).

SPERGON AS A SEED DISINFECTANT

R. W. Leukel

In a recent number of the Plant Disease Reporter, O. H. Elmer [1/] reported briefly on the use of Spergon as a treatment for sweet potatoes and suggested that the possibilities of this relatively new non-metallic seed disinfectant be further investigated and reported on by others in the interests of national defense, since seed disinfectants containing such metals as mercury and copper may not be generally available in the near future.

In response to this suggestion, the writer submits the following results from an experiment on the use of Spergon on sorghum seed for preventing seed rot and seedling blight and controlling covered kernel smut. In May 1940 seed of Sharon kafir was inoculated with spores of covered kernel smut at a 1-100 spore dosage, and separate portions of this lot were treated with New Improved Ceresan at 1/2 ounce per bushel, or copper carbonate or Spergon at 3 ounces per bushel. Plantings were made in the field at Beltsville, Maryland, and through the cooperation of A. F. Swanson, also at Hays, Kansas, in June 1940. Seed of kafir and feterita, treated as above, was also planted in the greenhouse in soil whose temperature averaged about 20° C. during the period of emergence. The data on emergence along with the field data on smut control are shown below.

Effect of certain seed disinfectants on emergence and covered kernel smut in sorghum.

Seed disinfectant	Rate per bushel	Emergence in feterita	Emergence in kafir	Smutted heads at Beltsville	Smutted heads at Hays
	Ounces	Percent	Percent	Percent	Percent
None	--	44	80	55	37
New Improved Ceresan	1/2	62	87	0	0
Copper carbonate	3	62	87	0	1
Spergon	3	75	88	0	0

1/ Elmer, O.H. The use of Spergon for sweet potato seed and sprout treatments. Plant Disease Reporter 26 (2): 44-46. 1942.

The excellent control of covered kernel smut obtained with Spergon in this experiment, along with its apparently beneficial effect on emergence, suggests the possibility of its being suitable also for treating wheat for the control of bunt. It might also be suitable for seed of corn, oats, barley, and other crops. Felix 2/ has reported extremely favorable results from its use on peas and cotton seed. It is hoped that this brief report will serve to stimulate further investigation of the possibilities of this material as a control for other seed-borne or soil-borne plant diseases. (DIVISION OF CEREAL CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, WASHINGTON, D. C.)

A FURTHER CORRECTION RE PHONY PEACH IN OKLAHOMA

Under date of March 3, 1942, Dr. K. Starr Chester addressed the following letter to the Survey:

> "With reference to your correction on page 82 in the current number of the 'Plant Disease Reporter', in particular, 'Phony peach has not been found in Oklahoma,' the 'Plant Disease Reporter' Supplement 85, 1933, page 36 states that the Division of Phony Peach Eradication found three infected trees in Oklahoma in 1932.
>
> "So far as I know, this is the only report of this disease in this State."

Dr. Chester is of course correct. The last sentence in the correction (P.D.R. 26:82) should read, Phony Peach was not found in Oklahoma in 1939.

2/ Felix, E. L. Tetrachloro-para-benzoquinone, an effective organic seed protectant. (Abstract) Phytopath. 32: 6. 1942.

THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXVI March 15, 1942 Number 5

IN THIS ISSUE

CHECK LIST REVISION

Freeman Weiss

QUERCUS -- continued.

QUERCUS AGRIFOLIA Nee, COAST LIVE OAK. Large evergreen tree or shrub of Growth Regions 1 and 5. Including also Q. WISLIZENII A. DC., interior LIVE OAK OF G.R.'s 4, 5, 10; Q. KELLOGII Newb., CALIFORNIA BLACK OAK (deciduous) of G.R.'s 1, 3, 4, 5, 10.

Armillaria mellea Vahl ex Fr., root rot. Calif.
Botryosphaeria quercuum (Schw. ex Fr.) Sacc., on branches. Calif.
(Coryneum kunzei Cda.): Pseudovalsa longipes.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II). Calif., Oregon.
Cylindrosporium kelloggii Ell. & Ev. (? Septogloeum defolians Harkn.), leaf spot. Calif.
Dichaena quercina Pers. ex Fr., on twigs. Calif.
Endothia gyrosa (Schw.) Fr. and E. singularis (Schw.) Shear & N. E. Stevens, on branches. Calif.
Erysiphe trina Harkn., powdery mildew, witches'-broom. Calif.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled heart rot. Calif.
Gloeosporium quernum Harkn., leaf blight. Calif.
Gnomonia veneta (Sacc. & Speg.) Kleb., anthracnose. Oregon.
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Laestadia auripunctum Harkn., on leaves. Calif.
Lenzites betulina L. ex Fr., brown cubical wood rot. Calif.
Leptothyrium californicum Bubak, leaf spot (of Q. morehus Kell.). Calif.
Microsphaera alni DC. ex Wint., powdery mildew. Calif.
Monochaetia desmazierii Sacc., leaf spot. Calif.
Mycosphaerella dryophila (Cke. & Harkn.), on leaves. Calif.
Nummularia clypeus (Schw.) Cke., on branches. Calif., Oregon.
Phleospora hanseni Bubak, on leaves of Q. morehus Kell. Calif.
Phoma discosiiformis Cke. & Harkn., on leaves. Calif.
Phoradendron villosum Nutt., mistletoe. Calif., Oregon.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Calif.
Phyllosticta agrifolia Ell. & Ev., on leaves. Calif.
P. wislizenii Ell. & Ev. Calif.
Physalospora agrifolia Ell. & Ev., on leaves. Calif.
Phytophthora cactorum (Leb. & Cohn) Schroet., bleeding canker. Calif.
Polyporus dryophilus Berk., white pocket heart rot. Calif., Oregon.
P. sulphureus Bull. ex Fr., brown cubical heart rot. Calif.
P. versicolor L. ex Fr., sapwood rot. Calif., Oregon.
Pseudovalsa longipes (Tul.) Sacc., twig canker. Calif.
Septobasidium canescens Burt, on scale insects infesting bark. Calif.
Septoria quercicola Sacc., leaf spot. Calif.
Sphaeropsis quercina Cke. & Harkn., on branches. Calif. (An untenable name).
Sphaerotheca lanestris Harkn., brown mildew. Calif.

QUERCUS -- continued.

Stereum spp., wood rot. Occasional. Spp. reported include S. fasciatum Schw., S. gausapatum Fr., S. hirsutum Willd. ex Fr., S. rugosum Pers. ex Fr.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister.

QUERCUS ALBA L., WHITE OAK. Forest tree of Growth Regions 20, 22, 23, 24, 25, 26, 27, 28, 29, 30; cult. Zone IV; the vars. LATILOBA Sarg., PINNATIFIDA Michx., and REPANDA Michx. are sometimes distinguished. Including Q. BICOLOR Willd., SWAMP WHITE OAK of G.R.'s 21, 22, 23, 24, 25, 26, 27, 28; Q. CHAPMANII Sarg., CHAPMAN OAK, of G.R.'s 29, 30; and Q. STELLATA Wang., POST OAK, of G.R.'s 19, 20, 22, 25, 27, 28, 29, 30.

Aleurodiscus oakesii (Berk. & Curt.) Cke., smooth patch. N.Y. to N.Car. Iowa & Wis. A. candidus (Schw.) Burt and A. acerinus (Pers.) Höhn. & Litsch. also are reported on bark of living trees or causing wood rot in same range.
Anthostoma dryophilum (Curr.) Ell. & Ev., on dead branches. Iowa, N.J., Texas.
Armillaria mellea Vahl ex Fr., root & butt rot. Widespread.
Botryosphaeria quercuum (Schw. ex Fr.) Sacc., on branches. Ga.
Bulgaria inquinans Fr., on branches. Conn., N.J.
Clitocybe tabescens Scop. ex Fr., root rot. Okla.
Coccomyces triangularis (Schw. ex Fr.) Sacc., on twigs. Ga., Md., Ohio.
Conopholis americana Wallr., parasitic on roots. Va.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). N.J. to Ala., La., & Wis. (C. fusiforme Hedgc. & Hahn and C. strobilinum Hedgc. & Hahn, reported on Q. stellata in Miss. and S.Car., are included with this sp. by Arthur, but are distinct on their pine hosts (O,I).
Cryptosporella albofusca (Cke. & Ell.) Sacc., on branches. N.Y.
Cylindrosporium microspilum Sacc. & Wint., leaf spot. Mo.
Daedalea quercina L. ex Fr., butt rot, heart rot, Widespread. Other spp. reported as causing wood rot, sometimes in living trees, are D. ambigua Berk., Ark., Texas; D. confragosa Bolt. ex Fr., Eastern & Central States; D. unicolor, Ala., N.Car., Va.
Daldinia vernicosa (Schw.) Ces. & DeNot., wood rot. Eastern & Central States.
Dermatea lobata Ell., on branches. N.J., N.Y.
Diaporthe leiphaemia var. raveneliana (Thüm. & Rehm) Wehmeyer, on branches. Mass. to Fla., Mich. & Mo.
Dichaena quercina Pers. ex Fr., bark canker. N.J.
Diplodia longispora Cke. & Ell., twig blight. N.J., N.Y.
Dothiorella phomiformis (Sacc.) Petr. & Syd., leaf spot. Mass. to Va., Mo. & Wis.
Endothia gyrosa (Schw.) Fr., on branches & exposed roots. Ky., N.Car., S.Car.
Fistulina hepatica Huds. ex Fr., brown heart. Va.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled butt rot. Eastern & Central States. Other spp. causing wood rot often in living

QUERCUS -- continued.

trees, include F. connatus (Weinm. ex Fr.) Gill., Ohio; F. everhartii (Ell. & Gall.) Schrenk, Ind., N.Y., N.Car.; F. fomentarius (L. ex Fr.) Kickx, Ala.; F. igniarius (L. ex Fr.) Kickx, Vt.; F. lobatus (Schw.) Cke., Ark.; F. marmoratus Berk. & Curt., Ala.
Gloeodes pomigena (Schw.) Colby, on branches. Ala.
Gloeosporium septorioides Sacc. (Marsonia quercina Wint.), leaf spot. Ill., Md., Mo., N.Y., Wis.
G. umbrinellum Berk. & Br., leaf spot. Pa. (Possibly = G. quercinum Westend., conidial stage of Gnomonia quercina Kleb.)
Gnomonia veneta (Sacc. & Speg.) Kleb., anthracnose, leaf & twig blight. Eastern & Central States to Ga. & Kans.
Godroniopsis quernea (Schw.) Diehl & Cash, on twigs. N.J.
Graphium rubrum Rumbold, gray wood stain. Ohio to Ark. & S.Car.
Hydnum erinaceus Bull. ex Fr., white spongy rot, often in living trees. Pa. to N.Car. & Ark.
Lenzites betulina L. ex Fr., wood rot. Cosmopolitan.
Leptothyrium dryinum Sacc., leaf spot. Miss., Texas, Wis.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. N.Y. to Miss., Iowa & Wis.
M. quercus (Pk.) P. Magn., Md., Mo.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
M. a. var. calocladophora (Atk.) Salm. Tenn.
M. a. var. extensa (Cke. & Pk.) Salm. Ill., Iowa, N.Car.
Microstroma album (Desm.) Sacc., downy spot. W.Va.
Monochaetia desmazierii Sacc., leaf spot. Eastern States to S.Car., Ark. & Ill.
Morenoella quercina (Ell. & Mart.) Theiss., leaf spot, Fla.; twig blight, Texas.
Mycosphaerella spleniata (Cke. & Pk.) House, on fallen leaves. N.Y.
Nectria coccinea Pers. ex Fr. (? N. ditissima Tul.), trunk canker. Conn. to W. Va.
Nummularia clypeus (Schw.) Cke., on branches. N.Y. to Ga. & Ind.
Phoma glandicola (Desm.) Lev., on acorns & insect galls. Ind., N.Y., Ohio.
Phoradendron flavescens (Pursh) Nutt., mistletoe. N.Car. to Fla., Texas & Ind.
Phyllactinia corylea Pers. ex Karst., powdery mildew, N.J. to Ga. & Miss.
(Phyllosticta phomiformis Sacc.): Dothiorella phomiformis.
P. tumoricola Pk., leaf spot (associated with insect galls). N.Y.
Physalospora glandicola (Schw.) N.E. Stevens (Sphaeropsis gallae (Schw.) Berk. & Curt.), canker, dieback. Ill.
P. obtusa (Schw.) Cke. (Sphaeropsis malorum Pk.), on branches. Minn., Va.
P. rhodina (Berk. & Curt.) Cke. Va.
Phytophthora cinnamomi Rands, seedling wilt. Md.
Polyporus berkeleyi Fr., butt rot, string & ray heart rot. Ark., Mo.
P. croceus Pers. ex Fr., butt rot, white pocket heart rot. Ark., Mich.

QUERCUS -- continued.

P. dryadeus Pers. ex Fr., white root rot. Pa. to Va., Okla. & Texas.
P. dryophilus Berk., white pocket heart rot. N.Y. to Tenn., Texas, & Ill.
P. hispidus Bull. ex Fr., trunk canker, heart rot. Conn., Va.
P. sulphureus Bull. ex Fr., butt rot, brown cubical heart rot. Ark., Ind., W.Va.
Polyporus spp., wood rot, sometimes in living trees. P. frondosus Dicks. ex Fr., Ark.; P. gilvus (Schw.) Fr., widespread; P. obtusus Berk., N. Car., Tenn.; P. schweinitzii Fr., on roots. Pa.
Pseudovalsa longipes (Tul.) Sacc. (Coryneum kunzei Cda.), twig canker. N.J., Va., Iowa.
Scleroderma vulgare Hornem., parasitic mycorhiza. Mich.
Septogloeum querceum J.J.Davis, leaf spot. Wis. (=Marssonina ?)
Septoria quercus Thüm., leaf spot. Ill.
Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H.Miller, on leaves. Ga.
Sphaeropsis linearis Pk., on twigs. N.Y.
Sphaerotheca lanestris Harkn., brown mildew. Ala., Miss., Ill., Iowa.
Stereum gausapatum Fr., white pocket heart rot. Ind., N.Y.
S. subpileatum Berk. & Curt., white pocket heart rot. Ark., Del., Va.
Stereum spp., wood rot, chiefly of logs & stumps. S. fasciatum Schw., Ind., N.J., Va.; S. frustulosum Pers. ex Fr., N.E. and Central States; S. sericeum Schw., N.Car., Pa.
Strumella coryneoidea Sacc. & Wint., trunk canker. Conn. to Va. & Mo.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. N.E. to Central & Gulf States.
Thelephora albido-brunnea Schw. and T. terrestris Ehr. ex Fr., collar girdle of seedlings. Ind., N.Car.

QUERCUS ARIZONICA Sarg., ARIZONA WHITE OAK. Small tree or shrub of Growth Regions 10 & 11. Together with other shrubby, evergreen or partly evergreen, spp. of the white oak group in the Southwest and Pacific Coast regions, as Q. GRISEA Liebm., GRAY OAK; Q. SINUATA Walt.; Q. TOUMEYI Sarg., TOUMEY OAK; Q. ENGELMANNII Greene, ENGELMANN OAK; Q. OBLONGIFOLIA Torr., MEXICAN BLUE OAK; Q. DOUGLASII Hook. & Arn., CALIFORNIA BLUE OAK; Q. DIVERSICOLOR Trel., NETLEAF OAK; and Q. DUMOSA Nutt., CALIFORNIA SCRUB OAK. Q. EMORYI Torr., EMORY OAK, and Q. HYPOLEUCOIDES A. Camus (Q. hypoleuca Engelm.), SILVERLEAF OAK, also are included because of similar growth habit and range though of black oak affinities.

Armillaria mellea Vahl ex Fr., root rot. Calif.
Coryneum umbonatum Nees, on twigs. Calif.
Cronartium conigenum Hedgc. & Hunt, leaf rust (II,III). On Q. emoryi and Q. hypoleucoides, Ariz.
C. quercuum (Berk.) Miyabe, leaf rust (II,III). Ariz., Calif.

QUERCUS -- continued.

Fomes applanatus (Pers. ex Fr.) Gill., white mottled butt & heart rot. Ariz., Calif.
F. everhartii (Ell. & Gall.) Schrenk, white flaky heart rot. Calif.
Nummularia clypeus (Schw.) Cke., on branches. Ala.
Phoradendron villosum (Pursh) Nutt., mistletoe. Calif., Oregon.
Phyllosticta livida Ell. & Ev., leaf spot. Calif.
Polyporus dryophilus Berk., white pocket heart rot. Ariz., Calif., N.Mex. Other spp. causing wood decay, sometimes in living trees, include P. biformis (Klotzsch) Berk., Ariz.; P. gilvus (Schw.) Fr., Ariz., N.Mex.; P. obtusus Berk., Ariz.; P. tulipiferus (Schw.) Overh., Ariz.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Calif.
Trabutia erythrospora (Berk. & Curt.) Cke., leaf patch (epiphyllous). Ariz.

QUERCUS BICOLOR Willd., under Q. ALBA.

QUERCUS BOREALIS Michx. f. (? Q. rubra L.), NORTHERN RED OAK. Forest tree of Growth Regions 21, 22, 23, 24, 25, 26, 27; widely grown for shade, Zone IV. A more robust form, usually designated as Q. BOREALIS var. MAXIMA (Marsh.) Ashe, EASTERN RED OAK, occurs in the same range. (Some recent authorities have concluded that this oak is, after all, the one Linnaeus called Q. rubra, a name now widely accepted as belonging to the Southern red oak. Rehder's derogation of Q. rubra L. as a confused name, with Q. borealis retained for the Northern red oak and Q. falcata for the Southern, seems a successful disposition of the question and is followed here.)

Armillaria mellea Vahl ex Fr., root rot. Widespread.
Botryosphaeria melanops (Tul.) Wint. (Dothiorella advena Sacc.), on branches. Conn.
Coccomyces triangularis (Schw.) Sacc., on twigs. Md.
Conopholis americana Wallr., parasitic on roots.
Coryneum kunzei Cda., twig blight, canker. Iowa, Mass., Mich.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Widespread.
Daedalea quercina L. ex Fr., wound rot, brown crumbly heart rot. Widespread.
D. confragosa Bolt. ex Fr., Me., N.Y.
Diplodia longispora Cke. & Ell., twig blight. Ohio.
Dothiorella phomiformis (Sacc.) Petr. & Syd., leaf spot. N.Y., Vt.
Endothia gyrosa (Schw.) Fr., on bark of exposed roots, ? canker. Ga., Ind., Mo.
E. parasitica (Murr.) P.J. & H.W. Anderson, on branches. Conn., Ind.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled butt rot. Widespread.
F. connatus (Weinm. ex Fr.) Gill., wood rot. Mass.

QUERCUS -- continued.

F. everhartii (Ell. & Gall.) Schrenk., trunk canker, heart rot. Mich., Minn.
F. igniarius (L. ex Fr.) Kickx, white heart rot, wound rot. Conn., Minn.
F. lobatus (Schw.) Cke., wood rot. N.Y.
Gloeosporium septorioides Sacc., leaf spot. Va.
Gnomonia veneta (Sacc. & Speg.) Kleb., leaf blight. Conn. to Ga., Ind., & Minn.
Graphium rigidum (Pers.) Sacc. & G. rubrum Rumbold, wood stain. Ind.
Hydnum erinaceus Bull. ex Fr., white spongy rot. Eastern to Gulf States.
Lenzites betulina L. ex Fr., wood rot. Cosmopolitan.
Leptothyrium dryinum Sacc., leaf spot. Ga., N.Y., Wis.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. N.Y. to Iowa & Wis.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
M. a. var. extensa (Cke. & Pk.) Salm. Md., Pa., Ohio, N.Car.
Monochaetia desmazierii Sacc., leaf spot. Pa. to Ga., Tenn. & Ohio.
Morenoella quercina (Ell. & Mart.) Theiss., purple blotch. Ga., N.Car., Va.
Nectria cinnabarina Tode ex Fr., on twigs. Ind., Pa.
N. coccinea Pers. ex Fr. (N. ditissima Tul.) and N. galligena Bres., branch & trunk canker. N.H. to W.Va.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Ill., Ind., Ohio, Va.
Physalospora glandicola (Schw.) N.E. Stevens, twig blight, nut rot. Md., Mass.
P. obtusa (Schw.) Cke., twig blight. Minn.
Phytophthora cinnamomi Rands, seedling wilt. Md.
Polyporus dryadeus Pers. ex Fr., white root & butt rot. Va. to Texas.
P. spraguei Berk. & Curt., butt rot, brown cubical heart rot. Ind., Mass., Va., Wis.
P. sulphureus Bull. ex Fr., brown heart rot. Widespread.
Polyporus spp. Others reported causing wood decay, sometimes in living trees include: P. albellus Pk., Me.; P. biformis (Klotzsch) Berk., Ind.; P. cinnabarinus Jacq. ex Fr., Me., Vt., Wis.; P. compactus Overh., Me.; P. dichrous Fr., Me.; P. frondosus Fr., Mass.; P. gilvus (Schw.) Fr., N.Y.; P. graveolens (Schw.) Fr., N.Y.; P. hirsutus Wulf. ex Fr., Me., Vt., Wis.; P. hispidus Bull. ex Fr., Conn.; P. obtusus Berk., Minn.; P. semipileatus Pk., P. versicolor L. ex Fr., widespread.
Pseudovalsa longipes (Tul.) Sacc., twig canker. Iowa.
Septoria sp., leaf spot. Pa. S. quercicola (Desm.) Sacc., Minn., N. Car.
Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H. Miller, on leaves. Ga.
Stereum spp. (S. frustulosum Pers. ex Fr., S. gausapatum Fr. and S. subpileatum Berk. & Curt.), sprout butt rot, white pocket heart rot. Widespread. Other spp. as S. fasciatum Schw., S. hirsutum Willd. ex Fr. and S. lobatum (Kze.) Fr. common on dead wood.

QUERCUS -- continued.

Strumella coryneoidea Sacc. & Wint., trunk canker. Minn., Mo., N.Y., Pa.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. General.
T. rubrobrunnea (Pk.) Sacc., N.Y.

(QUERCUS CALIFORNICA (Torr.) Cooper): Q. KELLOGGII Newb.
(QUERCUS CATESBAEI Michx.): Q. LAEVIS Walt.

QUERCUS CHRYSOLEPIS Lieb., CANYON LIVE OAK. Evergreen tree, often shrubby, of Growth Regions 1, 4, 10, 11 & 14, grown for shade & ornament in Calif.; also Q. PALMERI Englem., PALMER OAK, of G.R.'s 9, 11, & 14; and Q. TOMENTELLA Engelm., ISLAND LIVE OAK, of S. Calif. coast.

Cercospora macrochaeta Ell. & Ev., leaf spot. Calif.
Cronartium quercuum (Berk.) Miyabe, leaf rust II, III. Calif.
Lenzites betulina L. ex Fr., wood rot. Oregon.
Mycosphaerella operculata (Sacc.), on leaves. Calif. to Wash.
Phoradendron villosum Nutt., mistletoe. Calif., Oregon.
Phyllosticta agrifolia Ell. & Ev., leaf spot. Calif.
Polyporus dryophilus Berk., white pocket heart rot. Ariz., Calif.
P. sulphureus Bull. ex Fr., brown heart rot. Calif.
Venturia echinata (Ell. & Ev.) Theiss., black patch. Calif., Oregon.

QUERCUS CINEREA Michx., under Q. PHELLOS.
QUERCUS COCCINEA Muench., SCARLET OAK. Forest tree of Growth Regions 21, 22, 23, 24, 25, 26, 27, 28; also cult. for shade & ornament, Zone IV. Including Q. GEORGIANA Curtis, GEORGIA OAK, of G.R.'s 27 & 28.

Armillaria mellea Vahl. ex Fr., root rot. Widespread.
Botryodiplodia ravenelii Sacc. (=Physalospora glandicola?), twig blight. Ohio.
Botryosphaeria quercuum (Schw. ex Fr.) Sacc., on branches. Ga.
Bulgaria inquinans Pers. ex Fr., on branches. Ala., Conn., N.Y.
Cenangium tetrasporum (Ell.) Sacc., on branches. N.J.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Conn. to Va. and Minn.
Dichaena quercina Pers. ex Fr. and D. strumosa Fr., branch canker. Ga., N.J.
Diplodia longispora Cke. & Ell., on branches. N.J., Va.
Endothia gyrosa (Schw.) Fr., on branches & exposed roots. Mich. to Ga. & N.Car.
Fomes applanatus (Pers. ex Fr.) Gill., butt rot, white mottled heart rot. Widespread.
F. everhartii (Ell. & Gall.) Schrenk, white flaky heart rot. Widespread.
Gloeosporium septorioides Sacc., leaf spot. N.J. to Mich. & Kans.

QUERCUS -- continued.

Gnomonia veneta (Sacc. & Speg.) Kleb., leaf spot. R.I.
Godroniopsis quernea (Schw.) Diehl & Cash, on branches. Ala., Conn., N.J.
Leptothyrium dryinum Sacc., leaf spot. Iowa, N.J., Pa.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Ill., Mich., Minn.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread. Var. extensa (Cke. & Pk.) Salm., Ohio.
Monochaetia desmazierii Sacc., leaf spot. Md., Tenn.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. N.Car.
Nectria sp., trunk canker. Conn., Mass.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Ga.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Va. to Tenn. and Ill.
Physalospora obtusa (Schw.) Cke., on branches, ? canker. Minn., Va.
P. quercifolia (Cke.) Ell. & Ev., on leaves. Ohio.
Polyporus dryophilus Berk., butt rot, white pocket heart rot. Md.
P. hispidus Bull. ex Fr., trunk canker, heart rot. Conn.
P. sulphureus Bull. ex Fr., brown heart rot. Minn.
Polyporus spp., wood rot, sometimes in living trees. P. croceus Pers. ex Fr., Mo.; P. gilvus (Schw.) Fr., Pa.; P. graveolens (Schw.) Fr., N.Y.; P. hirsutus Willd. ex Fr., widespread; P. spraguei Berk. & Curt., Ind., Va., Wis.
Pseudovalsa longipes (Tul.) Sacc., on twigs, ? canker. Pa.
Sphaerognomonia polystigma (Ell. & Ev.) J.H. Miller & Thompson, on leaves. Ga., N.J., Ohio.
Stereum subpileatum Berk. & Curt., white pocket butt & heart rot. Eastern States.
Strumella coryneoidea Sacc. & Wint., trunk canker. N.E. and Great Lakes States.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Widespread.
Ustulina vulgaris Tul., wood rot. Occasional.

QUERCUS DIVERSICOLOR Trel., Q. DOUGLASII Hook. & Arn., Q. DUMOSA Nutt., under Q. ARIZONICA.
QUERCUS ELLIPSOIDALIS E.J. Hill, under Q. PALUSTRIS.
QUERCUS EMORYI Torr. and Q. ENGELMANNII Greene, under Q. ARIZONICA.

QUERCUS FALCATA Michx., SOUTHERN RED OAK (Spanish oak). Large tree of Growth Regions 20, 25, 27, 28, 29, 30. Including the var. PAGODAEFOLIA Ell., SWAMP SPANISH OAK; also Q. TEXANA Buckl., TEXAS OAK, and Q. SHUMARDII Buckl., SHUMARD OAK (which may together constitute only one sp.) of G.R.'s 16,19, & 22 in addition.

Ceratostomella pluriannulata Hedgc., blue stain. Miss.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Md. to Ga. and Miss. (C. fusiforme Hedgc. & Long reported in N.Car.)
Endothia gyrosa (Schw.) Fr., on branches & exposed roots. N.Car., Tenn. & Va.

QUERCUS -- continued.

Fomes applanatus (Pers. ex Fr.) Gill., butt rot, heart rot. Widespread.
F. everhartii (Ell. & Gall.) Schrenk and F. igniarius (L. ex Fr.) Kickx, wound rot, heart rot. Widespread.
F. fomentarius (L. ex Fr.) Kickx and F. marmoratus Berk. & Curt., wood rot. Occasional.
Ganoderma curtisii (Berk.) Murr., root & butt rot. S.Car.
Gnomonia veneta (Sacc. & Speg.) Kleb., leaf blight. Tenn.
Hydnum erinaceus Bull. ex Fr., white spongy heart rot. Widespread.
Microsphaera alni DC. ex Wint., powdery mildew. N.Car. to Texas.
Monochaetia desmazierii Sacc., leaf spot. Va. to Fla. & Tenn.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. N.Car.
Phoradendron flavescens (Pursh) Nutt., mistletoe. N.Car. to Fla. & Texas.
Polyporus dryadeus Pers. ex Fr., white root & butt rot. Va. to Texas.
P. dryophilus Berk., white pocket heart rot. Ark.
P. frondosus Dicks. ex Fr., yellowish heart rot. Va.
P. obtusus Berk., white spongy heart rot. Ala.
Septoria dryina Cke., leaf spot. S.Car.
Stereum frustulosum Pers. ex Fr., white pocket heart rot. Va.
S. subpileatum Berk. & Curt., Ark., Va.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. N.Car. to Ala. & Okla.
Volvaria bombycina Pers. ex Fr., wound rot. Ga.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY)

NOTES ON PLANT DISEASES IN NORTH CAROLINA IN 1941

Following are brief notes on diseases occurring on various crops in North Carolina in 1941. The abnormal temperature and precipitation conditions that prevailed during the year had marked effects on the spread and severity of many common diseases. Total precipitation for the year was approximately normal (Fig. 1); however, it was extremely uneven in distribution, resulting in two distinct droughts, one in April, May, and June, and the other extending from August to November, inclusive. A period of excessive precipitation occurred in July; however, this was not of sufficient duration to permit above ground diseases to reach epidemic proportions. Abnormally high temperatures prevailed during the spring and fall droughts (Figure 2). -- Luther Shaw.

APPLE DISEASES. J. A. Lyle and Luther Shaw.

Apple scab (Venturia inaequalis) was present only to a slight degree in regularly sprayed orchards in North Carolina, as a result of the unusually dry weather which prevailed until July 1. The first ascospore discharge was noted in Buncombe County on April 18. The ascospores were mature at this date. Secondary scab lesions were present by July 3.

Fire blight (Erwinia amylovora) appeared during the latter part of May in scattered areas throughout the State, being first observed in

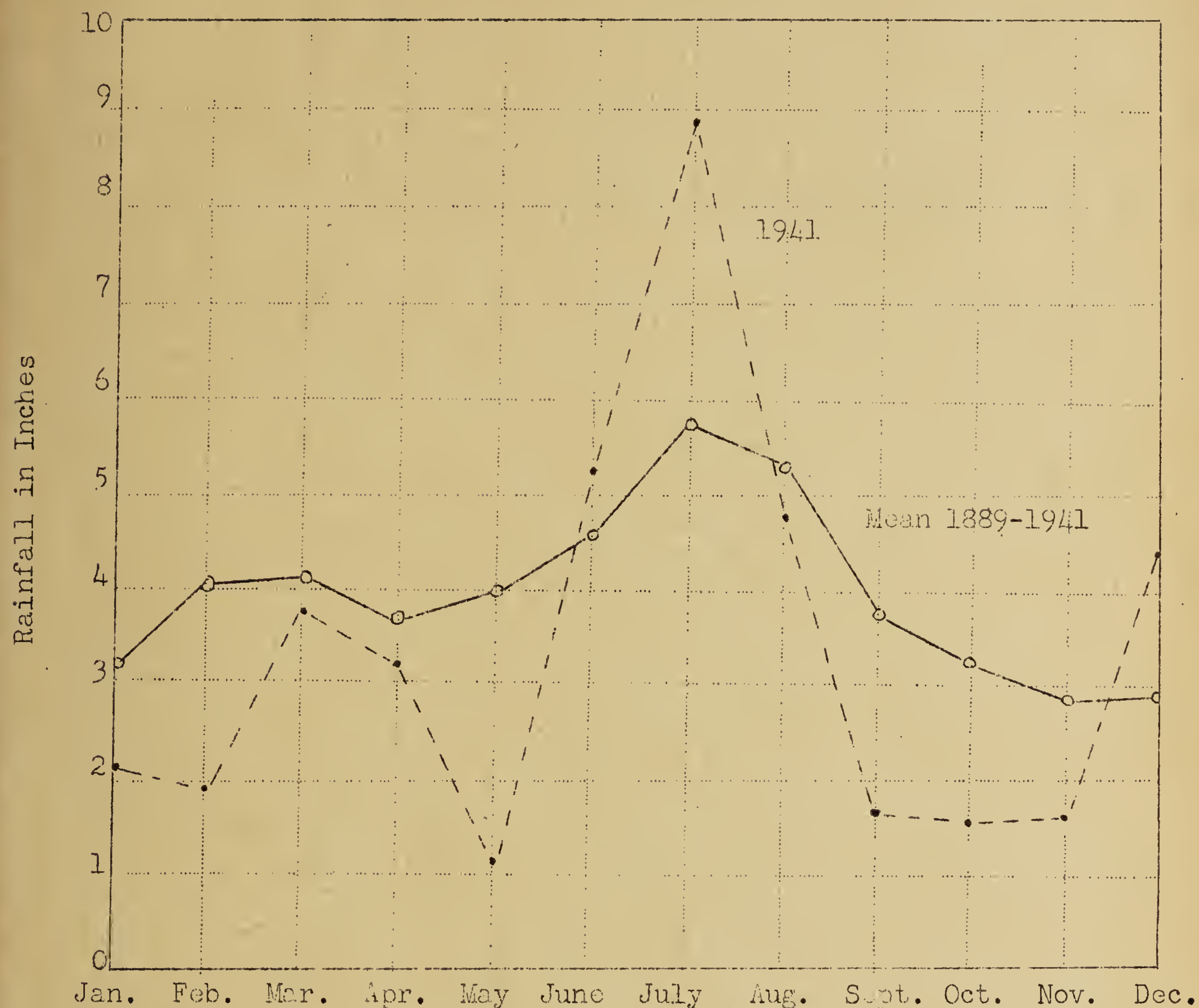

Figure 1. Rainfall in North Carolina, 1941.

Buncombe County on May 24. It was of no particular consequence in most orchards, but was severe in the piedmont area in both home and commercial orchards.

Bitter rot (Glomerella cingulata), in sprayed orchards caused no injury to such varieties as Delicious, Limbertwig, or Winesap. It was present, however, even in sprayed orchards on such varieties as Baldwin and Wolf River scattered throughout the State. Bitter rot lesions on the fruit were first apparent on July 31.

Blotch (Phyllosticta solitaria) caused no damage anywhere in regularly sprayed orchards. Frog-eye leafspot (Physalospora obtusa) and apple

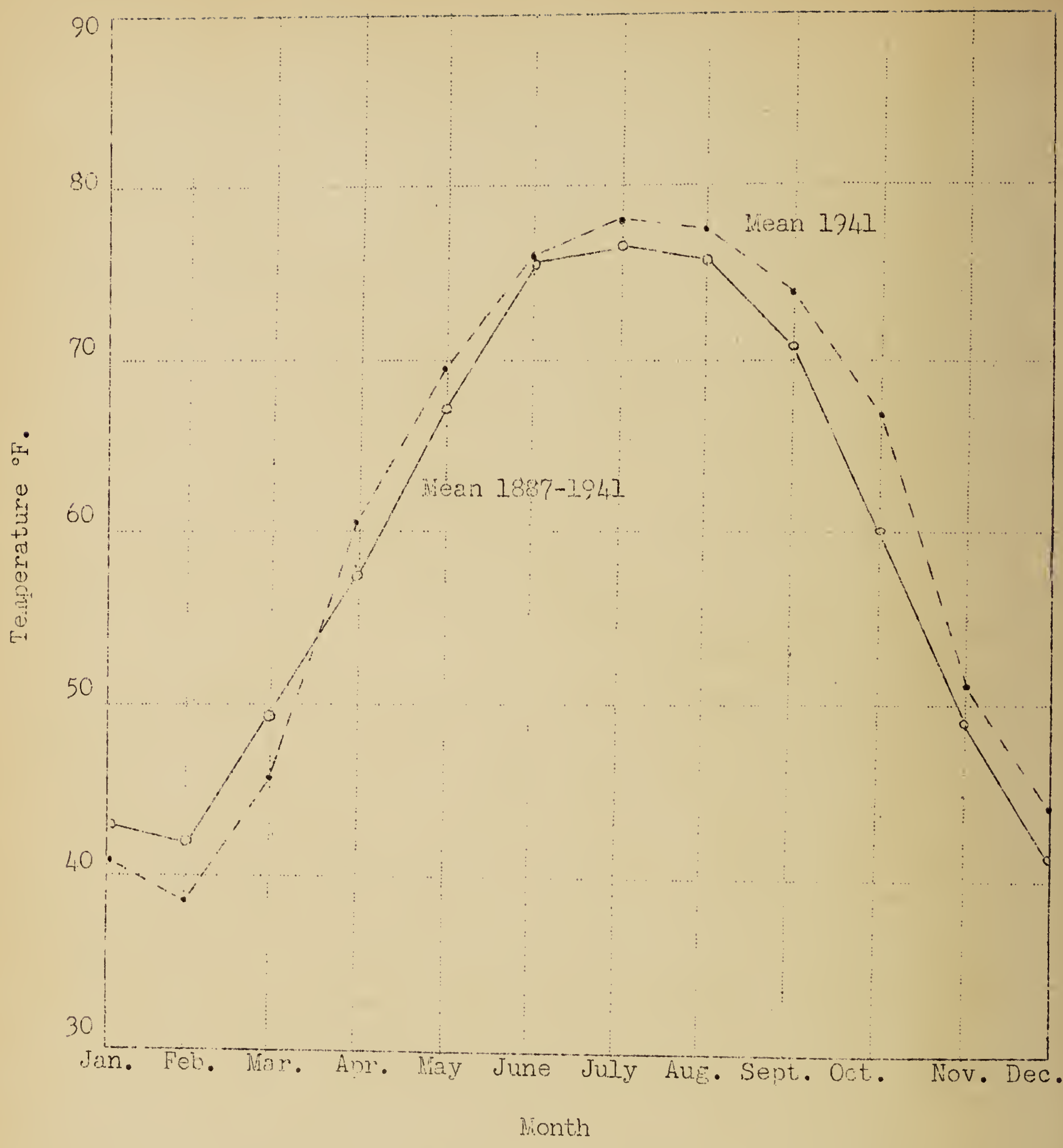

Figure 2. Mean temperatures in North Carolina.

rust (Gymnosporangium sp.) were also of no consequence. Sooty blotch (Gloeodes pomigena) and flyspeck (Leptothyrium pomi) were present to some extent in some parts of the State even in sprayed orchards.

Spray burn to foliage and fruit, particularly to the foliage, was present to a greater or lesser extent in certain orchards. Arsenical injury to the foliage, which resembled frog-eye leaf spot so much that it was often impossible to distinguish between the two types of leaf lesions, was noticeable. Copper injury both to fruit and foliage was apparent, particularly on those trees which were sprayed with the stronger applications of Bordeaux mixture.

COTTON DISEASES. S. G. Lehman.

Angular leaf spot (Bacterium [Phytomonas] malvacearum). In the areas visited by the writer (Piedmont and Upper Coastal Plain), lesions on seedling leaves were relatively few and inconspicuous compared to other years of greater rainfall during the period of seedling emergence and growth. In July and early August, however, some fields were found in which considerable angular leaf spot defoliation was occurring as a result of infections following rains in June and July. It was estimated that 10% of the leaves had fallen in some fields as a result of angular leaf spot infections. Very few boll infections were observed owing to the scanty rainfall during the period of boll development and maturation.

Anthracnose (Glomerella gossypii). Pre-emergence killing of seedlings was evident from the thin and irregular distribution of seedlings along the rows in about 20% of the fields examined. Contrary to observations of other years, however, very few seedlings died after emergence; in fact in fields known to have been planted with diseased seed, it was often difficult to find a seedling dead or obviously dying after emergence. However, removal of seedlings from such fields revealed anthracnose lesions on stems below the soil line. In 16 fields tested by removal of 25 seedlings at random, the number of diseased seedlings ranged from none to 84%, and averaged 28% of the total pulled. In 11 other fields in which seedlings were pulled until 25 diseased seedlings were found, the diseased seedlings ranged from 19 to 83% and averaged 40% of the total seedlings pulled. The lesions on the greater part of these seedlings were due to G. gossypii as indicated by appearance and by microscopic examination of some of them. Recognizable anthracnose infection on bolls was very uncommon in the areas visited. This was due apparently to scanty rainfall during the times the bolls were developing.

Pink boll rot (Fusarium moniliforme). This boll rot was not observed in the areas visited. In ordinary years pink boll rot can easily be found in almost any field one may examine.

Cercospora leaf spot (Cercospora gossypina). One field was found in which the leaves were very heavily infected with a Cercospora believed to be C. gossypina. As many as 25 to 50 lesions were present on a significant proportion of the leaves with some lesions on practically all the leaves. The more heavily infected leaves were becoming yellow and dropping prematurely. Potash deficiency was indicated by certain leaf symptoms and this condition may explain the high susceptibility of the foliage to infection by C. gossypina. Seed from the same source planted elsewhere showed very much less of Cercospora leaf spot.

Wilt (Fusarium vasinfectum) was more prevalent and destructive than usual on susceptible varieties.

POTATO DISEASES. L. W. Nielsen.

The extremely dry growing season experienced by the early potato growers in eastern North Carolina in 1941 had an appreciable effect on the incidence of diseases in the early crop.

Scab (Actinomyces scabies) was worse than usual, appearing on some farms where it had never been found before. On other farms where it had been present in previous years the entire crop had to be sold without grading. The disease reached economic importance only in localized areas, and then usually on the more sandy soils where the soil tested above pH 5.0.

Blackleg (Erwinia carotovora) [E. phytophthora] was generally distributed throughout the potato growing area, but was serious on a relatively small number of farms. The highest infection, about 10%, was observed on a small acreage near Elizabeth City. For the whole area the amount of blackleg was less than one per cent.

Southern bacterial wilt (Phytomonas solanacearum) was the most serious disease in the potato area with greatest infection occurring in Pamlico County. Here the disease developed most seriously in low muck soils where the crop was harvested in late June or early July. The infection in a few cases was as great as 50 to 75% and the harvested crop was not disposed of through regular commercial channels owing to tuber rot. On the whole the disease was not so serious as it had been in previous years.

Transit rots presented no serious problem in 1941. Following a series of rain storms in late June in Camden County, a few cars of packed potatoes had to be regraded before shipping because of tuber rot. The potatoes were packed while wet and dirty and the rot was initiated at cuts, bruises or other injuries.

Bacterial ring rot [Phytomonas sepedonica] was not observed.

Early blight (Alternaria solani) appeared late in the growing season and was distributed throughout the potato area. On a few farms in Camden and Currituck Counties the foliage in some fields was nearly all destroyed. The reduction of yield in these fields was not determined.

A brief survey of the late potato area of western North Carolina was made during late July. Late blight (Phytophthora infestans) was the most common disease. Owing to the dry season foliage infection was not progressing very rapidly. A disease having the gross symptoms of purple top was found in a small planting on the Experimental Test Farm at Swannanoa. Most of the potatoes were nearing maturity and it was difficult to identify virus diseases positively in the certified seed plots. The plantings appeared to be relatively free of these diseases. Flea beetle injury was serious in some table stock plantings.

PEACH DISEASES. Luther Shaw.

Bacteriosis (Bacterium [Phytomonas] pruni) was of no economic importance in commercial peach orchards in North Carolina in 1941. Active infections were not found in many orchards where the disease was prominent in 1940. This was surprising since a period of heavy and more or less continuous precipitation occurred in midsummer when primary and rapid secondary

infections might be expected. Failure of such infections to take place was evidently related to some condition or combination of conditions of natural origin that had obtained during the winter or spring and had resulted in either inactivation or eradication of the overwintered inoculum. It is suggested that the extremely low precipitation and high temperatures that prevailed in April and May could have been major contributing factors.

Brown rot (Sclerotinia [Monilinia] fructicola) was observed in a few orchards but did not develop in epidemic proportions. This again was evidently related to the spring and early summer drought which inhibited the development of apothecia on overwintered mummies and thereby prevented normal primary infections. The scattered infections observed in midsummer probably resulted from primary conidial inoculum emanating from twig cankers during the rainy period that occurred at that time.

Scab (Cladosporium carpophilum) was prominent in several unprotected orchards, but was of no consequence in orchards systematically sprayed.

Curl (Exoascus [Taphrina] deformans) was not observed in a commercial orchard.

Root knot (Heterodera marioni) was unusually active, at least in its effects, during 1941. It is probable that the nematode itself was no more active than normal; however, affected trees were less able to survive with depleted root systems under the prevailing drought conditions. In consequence, there was an unusually heavy death of trees as a result of this disease during the 1941 season.

PEANUT DISEASES. Luther Shaw and T. T. Hebert.

Cercospora leafspots (Cercospora spp.) were generally prevalent but were not so severe as in previous years. A period of high rainfall in July favored primary and some secondary infections, but the period of drought in August and September materially retarded subsequent secondary infections. In consequence the effects of leafspot on shedding of foliage and reducing yields was somewhat overshadowed by the more pronounced effects of drought. Experimental dusts and sprays gave significant control of leafspots in the 1941 experiments, but did not result in increased yields of peanuts and hay of the magnitude obtained in previous years, which was evidently related to the drought conditions mentioned above.

Root rots were in general less severe than during years of normal precipitation, with the exception of rots caused by Rhizoctonia. Results of survey isolations indicated that this parasite was as prevalent as usual.

SMALL GRAINS. H. R. Garriss.

Considering the State as a whole, diseases of small grains were not so prevalent in 1941 as in some previous years. Three factors are regarded as instrumental in reducing these losses: (1) adoption of seed treatments by an increased percentage of growers, (2) larger acreages planted to recently developed disease-resistant varieties, and (3) prevailing dry weather during the growing season.

Wheat

Stinking smut (Bunt) (Tilletia tritici) was of rare occurrence in most cultivated fields. This is attributed mainly to the more or less general practice of planting seed treated with ethyl mercury phosphate dust.

Severe damage from the disease occurred in some fields planted with untreated seed. One field in Halifax County showed 25% bunt infection.

Loose smut (Ustilago tritici) was not generally destructive, although traces were observed in many fields of Redheart. Leaps 157 seemed to be practically free of the disease. Some county agents called attention to a tendency of some Redheart strains to have a large percentage of plants with Blue Stem characteristics. Observations in the field showed that by far the greater percentage of loose smut was occurring on plants showing these characteristics.

Rust (Puccinia rubigo-vera tritici) was observed in some varieties in demonstration plots. Damage in the State as a whole was slight. Very little black stem rust (Puccinia graminis) was observed.

Mildew (Erysiphe graminis) was rather common on some varieties. Heavy infections were observed on the leaves late in the season after the heads were mature and, therefore, little damage resulted.

Nematode (Tylenchus [Anguina] tritici) caused serious damage in some fields in the Piedmont. One field in Cleveland County showed a 25% loss due to heavy infestation with the nematode. Losses from the disease were more or less localized and, generally, no serious losses occurred.

Oats

Loose smut (Ustilago avenae) was less severe than in the two preceding years, although several fields had infections too heavy for the fields to be certified (over 1%). The disease was most common on the Lee variety and was strikingly absent on Stanton, Victorgrain, Fullgrain 41, and Letoria. Covered smut (Ustilago levis [U. kolleri]) caused slight damage.

Barley

Black loose smut (Ustilago nigra) was observed in most fields planted to common varieties; however, losses from the disease did not exceed 2% in these fields. Heavy infections were observed in fields of Sunrise, a Japanese variety recently introduced into the State. Losses in these fields ranged from 15 to 25% of the crop. More traces of black loose smut were observed in some fields planted to Iredell and Bearded 15, two recently developed resistant varieties.

Brown loose smut (Ustilago nuda) was not generally destructive although some fields suffered severe infection. One field in Union County (Piedmont) showed 20% or more damage from the disease. The seed planted in this field was treated with ethyl mercury phosphate, but not by the hot water treatment. This seed came from a field planted in 1940 with hot-water-treated seed, in which no smut was observed. Evidently floral infection in the 1940 field was brought about by spores blown in from other fields in the community.

Stripe (Helminthosporium gramineum) occurred in many fields but in a mild form.

SOYBEANS. S. G. Lehman.

Bacterial pustule (Bacterium [Phytomonas] phaseoli sojense) was present to a greater or less extent in every field examined. In some of the fields marked defoliation of lower and middle portions of the plants occurred. An accurate estimate of the relative proportions of this defoliation due to bacterial pustule and to shading is quite impossible. However, the yellowing of leaves and necrosis of large areas in others well up on the plants and apparently receiving adequate light exposure indicates that a considerable part of the defoliation was due directly or indirectly to the disease.

Frog-eye (Cercospora daizu) was found in but few fields and only in small amounts in these. The varieties commonly grown are not highly susceptible to infection by C. daizu.

Downy mildew (Peronospora sojae). Traces were present in nearly all fields examined. As a rule infections were few in number in commercial fields. Certain varieties in variety test plots were heavily infected, the spots being so numerous as to give a yellowish color to leaves.

DISEASES OF FLUE-CURED TOBACCO. R. J. Shaw and T. E. Smith.

Black root rot (Thielavia [Thielaviopsis] basicola). Loss was very slight. The weather was unusually warm during late spring and early summer. This condition was not favorable for development of the disease. Consequently, damage was less severe than in recent years.

Black shank (Phytophthora [parasitica var.] nicotianae) is estimated to have destroyed 1000 acres of tobacco or about one-quarter of 1% of the State acreage. In Forsyth, Guilford, and Rockingham Counties about 5% loss occurred. This disease is also present in Person, Caswell, Yadkin, and Pitt Counties. It was more severe in 1941 than during any previous year and appeared to be spreading rapidly.

Blue mold [downy mildew] (Peronospora tabacina) caused no actual plant damage in 1941, but growers prepared approximately twice the required seedbed area in anticipation of a severe attack. It is estimated that over 23 million square yards of seedbed were sown that were not actually needed. This inefficient use of plant bed space could have been avoided if growers had planned to use recommended control measures.

Fusarium wilt (Fusarium sp.) was estimated to have destroyed 500 acres of tobacco or a trace for the St te as a whole. Serious losses occurred only in Columbus County where there is evidence of considerable spread in recent years.

Granville wilt (Phytomonas solanacearum) is estimated to have destroyed a total of 10,000 acres of tobacco or 2% of the State acreage. Heaviest losses occurred in Granville, Wake, and Durham Counties, but infested fields occurred in nearly all counties growing flue-cured tobacco.

Le f spot diseases. During the early part of the season there was very little rainfall. Consequently, damage due to leaf parasites was unusually light in 1941, only a trace resulting to the crop as a whole.

Mosaic (Virus) was probably the most destructive of all tobacco diseases in 1941. It was generally present, causing an estimated loss of 5% for the State as a whole. Damage from mosaic is difficult to estimate because it lowers the yield and quality of the crop rather than killing the plant.

Root knot (Heterodera marioni) was more severe in 1941 than during recent years. Unfavorably dry weather early in the season retarded growth resulting in heavy infestation before the crop matured. A loss of 3% was estimated to be caused by this disease which was most severe in the Coastal Plain area.

Sclerotium rolfsii and Rhizoctonia solani. Damage to the crop as a whole was only a trace. However, in isolated fields, losses as high as 50% were observed.

DISEASES OF VEGETABLE CROPS. D. E. Ellis and Sidney Cox.

Crucifers

Downy mildew (Peronospora parasitica) was unusually severe and caused extensive damage to cabbage and cauliflower seedlings in several localities in the coastal plains area in December 1941 and January 1942. The disease was particularly destructive in one locality in Beaufort County where losses in plant beds of 50 to 100% were observed. In another locality in Scotland County, an 8-acre drilled field-planting of cauliflower and cabbage seedlings was visited that showed uniform infection resulting in a loss of more than 50%.

Cucurbits

Leaf blight (Macrosporium cucumerinum) [Alternaria cucumerina] was widespread on cantaloupe and caused substantial losses in the commercial melon growing areas in Scotland and Warren Counties. Excessive rainfall immediately preceding and during the picking season heightened the severity of the disease.

Downy mildew (Pseudoperonospora cubensis) occurred on cucumbers and cantaloupes but appeared too late in the season to cause extensive damage. It was first observed in the State on cucumbers at Willard, in Pender County, on July 9 and later occurred on cantaloupes in Scotland County.

An unusual fruit rot of cantaloupe in the field was observed in Warren County in July. Approximately 25% of the fruit in a 10-acre field was affected with a soft rot that caused a rapid and complete breakdown of affected tissues. A sterile phycomycetous fungus and the bacterial rot organism Erwinia melonis were consistently associated with the disease. Entrance appeared to take place through the uninjured rind in contact with the soil. The disease was not confined to the mature cantaloupe but affected fruit at all stages of development.

Anthracnose (Colletotrichum lagenarium) was widespread on cantaloupes, cucumbers and watermelons. Watermelon wilt (Fusarium bulbigenum var. niveum) was observed in both commercial and home garden plantings in several southeastern counties. Erwinia carotovora was found consistently associated with a stem rot of squash in New Hanover and Wake Counties. Powdery mildew (Erysiphe cichoracearum) was observed in numerous field plantings of cantaloupe in June and July but was of minor importance.

Lettuce

Damping-off was widespread and severe in the commercial head lettuce areas of Pender and New Hanover Counties in January and February. Plant bed losses ranging from 25 to 90% were common throughout the area. Rhizoctonia solani was the most common organism found associated with the disease.

Pepper

Bacterial spot (Phytomonas vesicatoria) was observed in field plantings in Sampson and Duplin Counties in June and July. The disease caused substantial reduction in yields in a few fields but it was not widespread in the pepper producing area as a whole. Other pepper diseases of minor importance encountered in the same localities included southern root rot (Sclerotium rolfsii) and anthracnose (Gloeosporium piperatum).

Sweet Potato

Field and storage diseases of sweet potatoes caused severe losses in 1941. Diseases most frequently encountered included scurf (Monilochaetes infuscans), stem rot or wilt (Fusarium bulbigenum var. batatatis), black rot (Ceratostomella fimbriata), surface rot (Fusarium oxysporum), and internal breakdown (physiological).

Miscellaneous

The root knot nematode (Heterodera marioni) was widespread on a number of vegetable crops throughout the coastal plains area. The disease was particularly severe on such crops as tomato, okra, cantaloupe, bean, soybean, and field pea.

Other diseases, most of which were of minor importance, observed during the year included anthracnose (Colletotrichum lindemuthianum), blight (Phytomonas phaseoli) and mosaic of bean; leaf spot (Phoma betae) of beet; early blight (Alternaria solani) and Granville wilt (Phytomonas solanacearum) of tomato; and blight (Phomopsis vexans) of eggplant. (NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING)

FRUIT DISEASES IN THE OZARK SECTION OF ARKANSAS IN 1941

John C. Dunegan

This report, continuing the yearly summaries from Arkansas which have been published in the Plant Disease Survey Reporter since 1935, deals largely with the fruit-disease situation in the northwestern portion of the State. However, as in previous reports, the discussion is not confined entirely to this area.

The main problem confronting the growers in northwest Arkansas at the start of the 1941 season was the extent of the damage caused by the

very abrupt drop in temperature on November 11, 1940. Apple trees throughout the district apparently escaped serious injury but many peach trees showed very definite crotch and trunk injury. Some growers thought the trees were badly damaged and proceeded to remove them. The majority, however, were inclined to be more conservative and instead of initiating drastic measures decided to wait and see how the trees behaved during the spring. As the season progressed it became evident that in most peach orchards the injury was confined to the death of individual limbs and shoots rather than entire trees. In this respect the northwest Arkansas section was much more fortunate than fruit districts further north where large numbers of both peach and apple trees were killed by the November 11 freeze.

The start of the 1941 growing season was not marred by a sudden drop in temperature as the fruit trees came into bloom, such as occurred at the start of the 1939 and 1940 seasons. Warm clear weather prevailed during the blooming period and an excellent crop of peaches and plums set. A week of rainy weather when the apples were in bloom resulted in a light set in many orchards.

Rainfall was fairly adequate during the season, although there were periods of dry weather early in April, during the last half of May, and in August. The apple crop was seriously impaired by a late summer outbreak of the codling moth.

Apple Diseases

Apple scab (Venturia inaequalis). Routine examination of overwintered scab lesions on apple leaves showed that ascus formation had started in a few perithecia as early as January 25 but mature asci with colored spores were not collected until March 27. Although mature ascospores were found in the orchards 15 days earlier in 1941 than in 1940, the absence of rainfall during the first 12 days of April retarded the development of primary infections and it was not until the week of April 13-19 that environmental conditions were favorable for the discharge of ascospores. A few primary lesions were found on the leaves of non-sprayed trees on April 24 and conidial infections were fairly general on the same trees by May 8. Scab lesions on the fruit were first observed on May 15, the same date that they were found in 1940. The further development and spread of the fungus was retarded by a period of dry weather during the last 15 days of May and although there were frequent showers early in June, the fungus failed to achieve any widespread distribution and as in 1940 was of comparatively minor importance. Non-sprayed Ben Davis trees used as a check in the 1941 spray experiment had only 15.7% of the crop (drops and harvested fruit combined) infected as contrasted to 22.7% in 1940 and 79.7% in 1939.

The 1941 season is still another example of how closely the outbreaks of the apple scab fungus in northwest Arkansas are correlated with the environmental conditions. This relation was discussed in last year's report (PDR 25:63-71. Feb. 1,1941). It is evident that unless the fungus becomes well established early in April the chances are that it will not cause serious loss.

Apple blotch (Phyllosticta solitaria). Frequent periods of cool rainy weather during the months of June and July favored the development of

the apple blotch fungus in 1941 as in 1940. The first fruit infections were noted on June 18, one day later than in 1940, and the disease was prevalent on non-sprayed fruit by July 12. The non-sprayed trees in the 1941 spray experiment had 43% of the fruit infected as compared to 49.2% in 1940.

The disease caused no appreciable loss in properly sprayed commercial orchards.

Bitter rot (Glomerella cingulata). Environmental conditions were favorable to the development of this disease and scattered infections were reported from the same commercial orchard that reported its presence in 1940. At the present time bitter rot has practically disappeared from the orchards of northwest Arkansas and has been of no commercial importance for a number of years.

Cedar rust (Gymnosporangium spp.) Pycnia of G. juniperi-virginianae were noted on apple leaves during the week ending May 10. Except for the extensive development of lesions on the fruit of the San Jacinto variety at the University Farm, only occasional specimens were noted during the season. The disease was of no commercial importance in 1941.

Black rot (Physalospora obtusa). Some frog-eye leaf spot developed on the foliage of the non-sprayed trees in the 1941 spray experiment but the disease was only of minor importance. The black rot fungus developed around the rust lesions on the San Jacinto variety and much of the fruit of this variety was destroyed by these secondary infections.

Phytophthora canker (Phytophthora cactorum). This organism was isolated from cankers near the soil line on the main stems of 1-year old Grimes trees submitted by a nurseryman. Similar specimens have been received from time to time during the past 10 years but this was the first time a definite organism was isolated from the obscure cankers. The pathogenicity of the isolate was proved by inoculation experiments.

Peach Diseases

Winter injury. In northwest Arkansas the freeze of November 11, 1940, as already mentioned, caused considerable killing of individual branches on trees throughout the district. Typical trunk and crotch injury occurred in some orchards but there was no extensive killing of large blocks of peach trees. No reports of serious injury were received from the main peach producing areas south of the Ozark Mountains.

Brown rot (Sclerotinia [Monilinia] fructicola). Apothecia were found in the peach orchards around Fayetteville on March 31 and occasional specimens of blossom blight were noted in April. Early maturing varieties, such as Red Bird, only indifferently sprayed, suffered serious losses due to rotting of the fruit. The fungus was noted attacking the immature fruit of several nectarine trees in one orchard.

Typical blossom blight specimens were received from the Crowley's Ridge section in April and subsequent reports indicated that a number of orchards suffered serious loss from brown rot in 1941.

More complaints about inability to control this fungus were received in 1941 than for several previous years. It seems probable that there are many more "mummies" in the orchards and the fungus may cause serious damage if the right combination of environmental conditions prevail in the 1942 growing season.

Bacterial spot (Bacterium [Phytomonas] pruni), although present in most of the orchards of susceptible varieties in northwest Arkansas, was of relatively minor importance in 1941.

Rust (Tranzschelia pruni-spinosae discolor). Rust pustules were first noted on October 6 and by the end of the month were fairly prevalent in a number of peach orchards. No teliospores were found on the peach leaves in 1941. The typica variety occurring on wild cherry and plum also did not appear until late in the season but the fungus produced both urediospores and teliospores on these hosts.

Peach leaf curl (Taphrina deformans). A few specimens were collected on April 30 but the disease was of very minor importance in 1941. The warm dry weather prevailing early in April as the leaf buds unfolded presumably retarded the development of the fungus.

Peach rosette [virus]. An inspector of the Arkansas State Plant Board found several cases of peach rosette in a new locality near Rogers, Arkansas. The affected trees were destroyed. No additional cases were found on the farm where rosette was noted in 1939 and 1940.

Plum and Cherry Diseases

Bacterial spot (Bacterium [Phytomonas] pruni). Although this disease was not particularly important on the peach in 1941, numerous specimens on cultivated plums were received from various parts of the State.

Cherry leaf spot (Coccomyces hiemalis) was present in a number of sour cherry plantings but caused little defoliation in 1941.
(COOPERATIVE INVESTIGATIONS BETWEEN THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U.S.D.A., AND THE ARKANSAS AGRICULTURAL EXPERIMENT STATION).

HEAT INJURY TO THE LEAVES OF CALIFORNIA BLACK OAK AND SOME OTHER BROADLEAVES

J. L. Mielke and J. W. Kimmey

A reddish-brown discoloration of the leaves of California black oak (Quercus kelloggii Newb.) became evident over extensive portions of this tree's range in the northern part of California early in July 1941. On July 13, when the writers first observed affected trees in the upper Sacramento River Canyon the injury was so pronounced that it imparted a reddish-brown cast to entire mountainsides. On the affected leaves, except

for a relatively small percentage that turned entirely brown, the browning was confined mainly to a broad, irregularly shaped band around the margins. A high percentage of the most severely injured leaves dropped shortly after the injury occurred, but the majority of the leaves remained on the trees for the greater part of the summer. A few trees lost almost all their leaves in July, and most of these produced a small crop of new leaves that began to appear in late July and early August, accompanied by new woody growth.

No evidence of injury to the buds or twigs was found. Although no examinations were made of roots, it seems improbable that they were injured materially, considering the situation at Happy Camp, which is described below. Injury by smoke or fumes from manufacturing plants was unlikely since no such plants of consequence occur in that part of the State.

The browning of the leaves occurred quite generally on the slopes of the Sacramento River drainage up to an elevation of around 4,000 feet, and also in the Klamath River drainage in the vicinity of Happy Camp. The injury was noted as most severe in the vicinity of Delta, situated in the Sacramento Canyon about 25 miles north of Redding. A striking characteristic of the injury was its uniformity regardless of site conditions, i.e., degree of slope, aspect, or soil moisture conditions. Trees growing along the banks of streams were as severely affected as those on steep and well drained slopes.

An examination of numerous affected trees revealed no evidence of insect or fungus attack. Instead, the injury seemed plainly attributable to abnormal weather conditions. In the northern part of California precipitation and temperature during the winter of 1940-41 was considerably above normal. This was followed by a late spring with temperatures below and rainfall above normal at most stations. As a result of the cool, moist spring weather, together with an abundance of soil moisture from the heavy winter precipitation that occurred mainly in the form of rain, there was a luxuriant development of most plants. This was particularly the case with California black oak, which produced a good crop of large and succulent leaves that by early July had not yet attained a degree of maturity normal for that period.

There were a few hot days in the latter part of May and again the first part of June, but high temperatures for a continuous period did not occur until early in July. During the period July 5 to 12, inclusive, maximum temperatures at Redding ranged between 100° and 105°F. These are not excessively high early-July temperatures at this station. Pertinent weather records for Redding (elev. 718 ft.), the closest station to Delta (elev. 1,322 ft.) for which complete records are available, are presented in table 1 and figure 1. Since there is a difference of only about 600 feet in elevation between the two places, maximum temperatures at both should be fairly similar. A check of incomplete records at Delta indicate this to be the case.

During the cool period from June 22 to 26, inclusive (figure 1) a total of 0.90 inch of rain fell at Redding. Following this short rainy period the maximum daily temperatures continued to rise almost without interruption until a peak of 105°F. was reached on July 5. Residents of Delta stated that the browned appearance of the oaks became evident a few

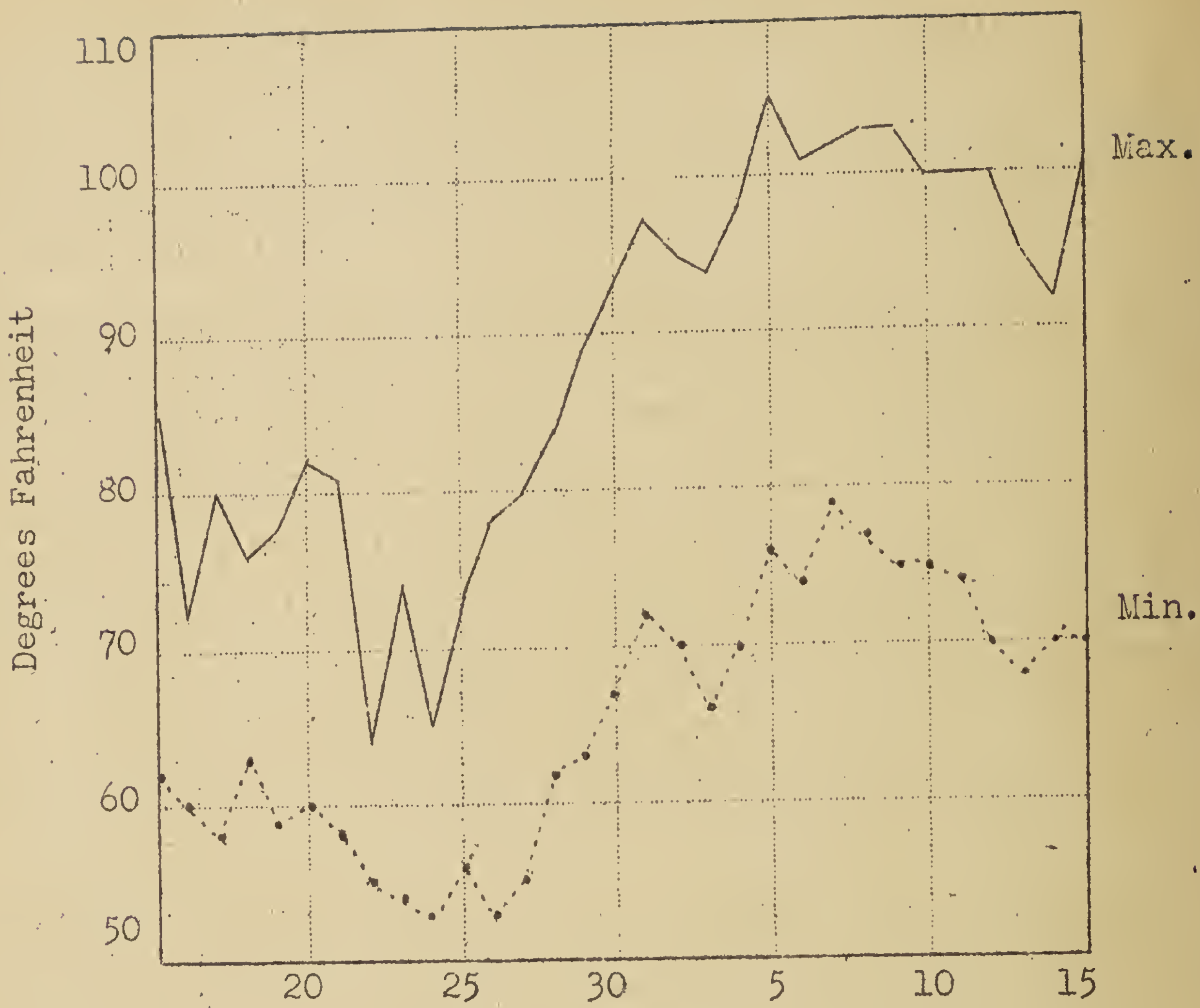

Figure 1.--Minimum and maximum temperatures at Redding, California, for the period June 15 to July 15, 1941.

Table 1.--Departure from normal temperature and precipitation, mean monthly temperature, and total monthly precipitation at Redding, California.[a]

Month (1941)	Temperature (degrees F.)		Precipitation (inches)	
	Mean [b]	Departure	Total for Month	Departure
January	48.5	+ 3.2	16.12	+ 9.26
February	51.2	+ 1.5	11.71	+ 5.10
March	57.0	+ 3.0	5.32	+ 0.63
April	57.4	- 2.4	6.78	+ 4.16
May	65.1	- 1.3	4.38	+ 2.85
June	71.4	- 3.7	1.26	+ 0.45
July	83.5	+ 1.7	Trace	- 0.09

a/ U.S. Weather Bureau records.
b/ For 66-year period.

days later. All evidence indicated the injury to be attributable to heat injury of the tender leaves induced by the sudden change to the high temperatures prevailing between July 5 and 12. There was an abundance of soil moisture at the time, no strong or drying winds occurred, and the relative humidity was not abnormally low for this section of the State. On the grounds of the U. S. Forest Service Ranger Station at Happy Camp it was of interest to note that California black oak was as severely browned as the trees of this species in the immediately adjacent forest, despite the fact that the lawn on which the station trees were growing was watered almost continuously during the hot spell by an efficient sprinkling system. This indicates that the injury could not be attributable to a lack of soil moisture.

The principal tree associates of the injured oak are ponderosa pine (_Pinus ponderosa_ Laws.), digger pine (_P. sabiniana_ Dougl.), Douglas-fir (_Pseudotsuga taxifolia_ (Poir.) Britton), bigleaf maple (_Acer macrophyllum_ Pursh), white alder (_Alnus rhombifolia_ Nutt.), and California buckeye (_Aesculus californica_ (Spach) Nutt.). The conifers showed no evidence of heat injury and the broadleaves only occasional traces of it even though in many instances they were growing intermingled with severely affected California black oak trees.

From Redding southward about 30 miles to Red Bluff the main tree species are canyon live oak (_Quercus chrysolepis_ Liebm.)and interior live oak (_Q. wislizenii_ A. DC.). In general the leaves of these two oaks were moderately injured as compared with California black oak in the vicinity of Delta, although a small percentage of the trees of both species were quite badly injured. At the time the injury occurred the maximum temperatures at Red Bluff ranged from 1 to 3 degrees higher than at Redding. (DIVISION OF FOREST PATHOLOGY, BUREAU OF PLANT INDUSTRY, COOPERATING WITH U. S. FOREST SERVICE, SAN FRANCISCO, CALIFORNIA).

OVERWINTERING OF CROWN RUST OF OATS IN ARKANSAS IN 1941-42

H. R. Rosen

On March 3, 1942, crown rust [_Puccinia coronata_] was found on oats, variety Lee, at the University farm, Fayetteville. A few more pustules were found on March 13. Since a severe epidemic of crown rust appeared in the fall of 1941 in the same field, there was excellent opportunity to trace the rust through the winter and early spring.

As reported previously (PDR 25: 480-481, 1941), a scattering of crown rust was first noted in this field on October 3, 1941. With a mild fall and ample rain, this rust became so common that by the second week of November many of the plants of the variety Lee showed approximately 50% of the leaf area infected. It continued to spread throughout the whole month of December, the rate of spread being considerably reduced toward the end of the month.

The first week in January brought a sharp drop in temperature and a snowfall of about 3.5 inches. While this snow was on the ground, the temperature reached a low of -11°F. The temperature remained below

freezing up to January 11. This freeze killed all the oat foliage above the snow level. But on January 13, when the snow was gone, the lowermost leaves, which had been covered with snow, remained green and showed numerous pustules of crown rust. The pustules appeared to be considerably reduced in size and during the month of February they suffered considerable reduction in number when many of the older leaves started waning and gradually dying.

By the first week in March, much of the rust had disappeared and many plants had to be examined before any pustules could be found. Most of the infected leaves that remained alive showed straw-colored, dead areas where the rust had been, indicating the death of the rust. Nevertheless, a few tiny pustules were located, and by March 13 some of these were found shedding urediospores.

There can be little doubt that crown rust overwintered in the uredial stage in this field, although the amount of overwintering represented a minute fraction of the initial number of infections. It is not known whether the overwintering was accomplished by means of mycelium or as uredial primordia. There is a suggestion that only the latter were involved since many leaves examined showed flecks suggestive of early stages of crown-rust infections but without indication that the fungus is capable of producing uredia. This suggestion requires verification.

Unlike the early spring of 1941, which showed no crown rust on winter oats, despite the severe fall epidemic of 1940 (the November 1940 freeze having killed apparently all of the rust), the stage in March 1942 is set for an epidemic of crown rust on winter oats in Arkansas, given favorable temperature and rainfall.
(ARKANSAS AGRICULTURAL EXPERIMENT STATION).

CURRENT REPORTS ON PLANT DISEASES

APPLE SCAB DEVELOPMENT IN ILLINOIS: Examination of about 50 perithecia of _Venturia inaequalis_ from leaves collected on February 5 showed one perithecium with three asci containing mature (brown) ascospores. This is the earliest date recorded for the State of Illinois. The previous record was February 22. Most of the asci from other perithecia were just forming but in a few they were at least half the normal length and on one leaf several asci were found in which the outline of the spores could be seen.

Leaves examined at intervals between February 5 and March 2 show little additional advance. A few mature ascospores were found on two dates since February 5 and some increase in the number of asci having outlined spores was noticed.

The early development of ascospores this year may be due to the unusual December and January weather conditions. In December at Urbana there were 18 days with maximum temperatures above 40° and 13 above 50°; in January there were 18 days with maximums above 40° and 10 days above 45°. While there was a very severe cold period from January 3-10 (-10° on January 10), the latter part of the month and the first few days of February

were uniformly warm. The lack of development after February 5 was due, no doubt, to a cold period with temperatures below freezing most of the time. (H. W. Anderson, University of Illinois, March 5).

TOBACCO PLANT BED DISEASES IN GEORGIA: Drowning and damping-off have taken a very heavy toll in many beds. In Tift and adjoining counties I estimate at least a 30% loss of the small plants. There is, as yet, very little blue mold [Peronospora tabacina] in this section because the plants are still quite small. (John G. Gaines, Assistant Pathologist, Division of Tobacco Investigations, Tifton, Georgia).

FEBRUARY WEATHER AND THE WINTER OF 1941-42

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for weeks ending March 3 and March 10, 1942.)

FEBRUARY WEATHER: The first decade of February 1942 was decidedly warm for the season throughout the country, except in the more eastern States where temperatures were slightly below normal. Following this mildness, there was a reaction to abnormally cold weather west of the Rocky Mountains during the week ending the 17th, and thereafter, and subnormal temperatures prevailed in nearly all States, especially during the week ending February 24. Thus, in general, the first half of the month was mild for the season to abnormally warm and the last half decidedly cold.

Figure 1 shows that the temperature for February, as a whole, averaged considerably below normal from the Ohio Valley southward, eastward, and northeastward, with the monthly deficiences mostly from 3° to 6°. The Pacific coast had about-normal warmth, but the Great Basin and the Rocky Mountain States were decidedly cold. On the other hand, the temperature averaged above normal from the Lake region westward to the Great Plains.

For February precipitation see below and figure 2.

THE WINTER OF 1941-42: The outstanding feature of the weather during the 1941-42 winter season (December-February) was the persistence of prevailing temperatures rather than the usual frequent alternations between relatively warm and cold successive short periods. The first decade of December was abnormally warm throughout the country, followed by a cold week in Eastern States, but a continuation of warmth in the West. The last half of December was abnormally warm, except for extremely cold weather during the last week in the more western States. The western low temperatures drifted slowly eastward and the first half of January had severe wintry conditions quite generally, followed, however, by abnormal warmth during the last half of the month. Again, the first half of February was mostly warm and the last half decidedly cold. Thus there was a general tendency during the winter for a given condition, relatively cold or warm, to persist in sequences of 2 weeks or more in duration.

Figure 3 shows the average departure from normal temperature for the 3 winter months (December-February) combined. For the country as a whole, the season was warmer than normal, although in most of the South, locally in the Northeast and in much of the Rocky Mountain and Great Basin

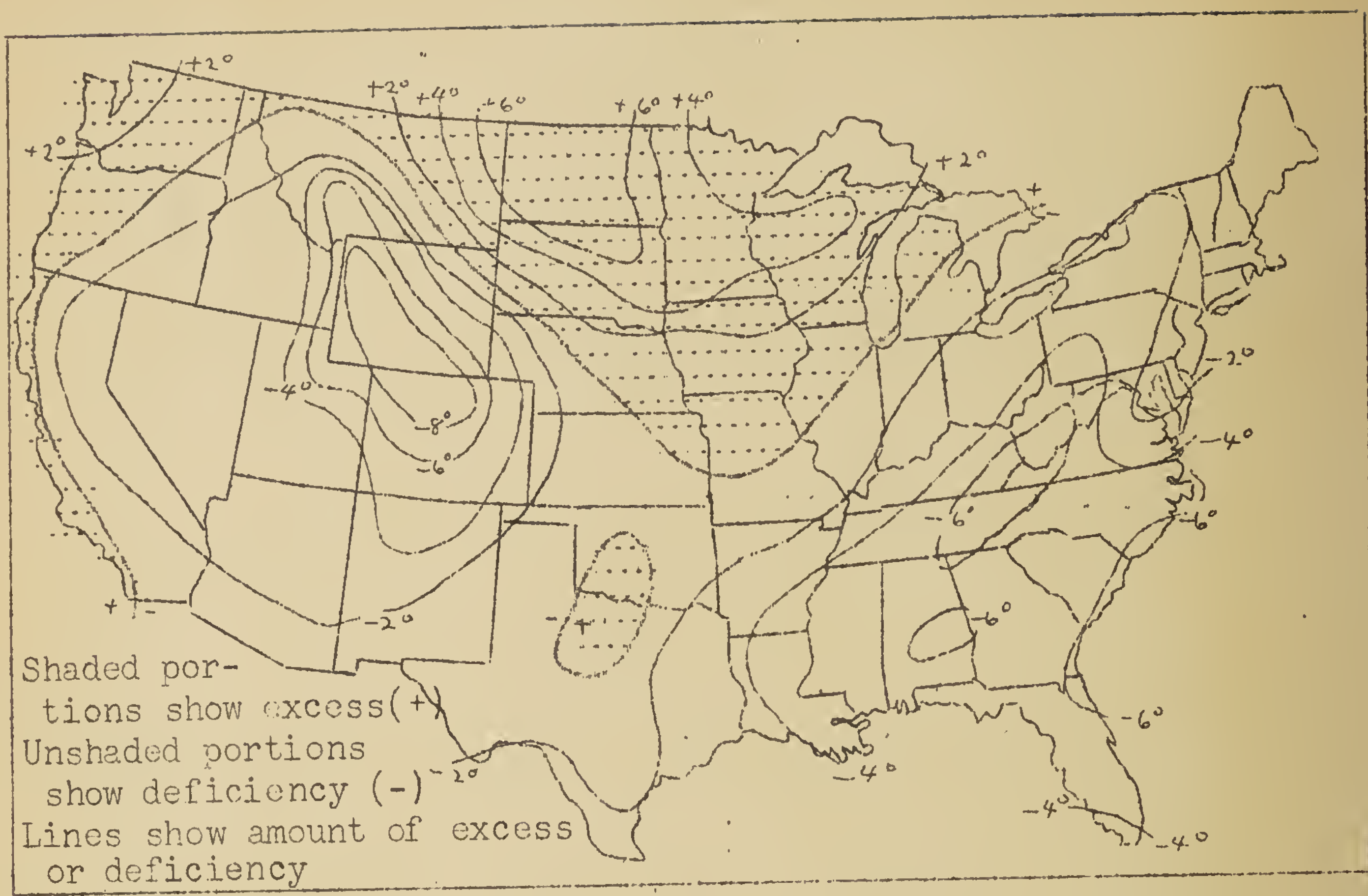

Figure 1--Departure of Mean Temperature from the Normal for February 1942.

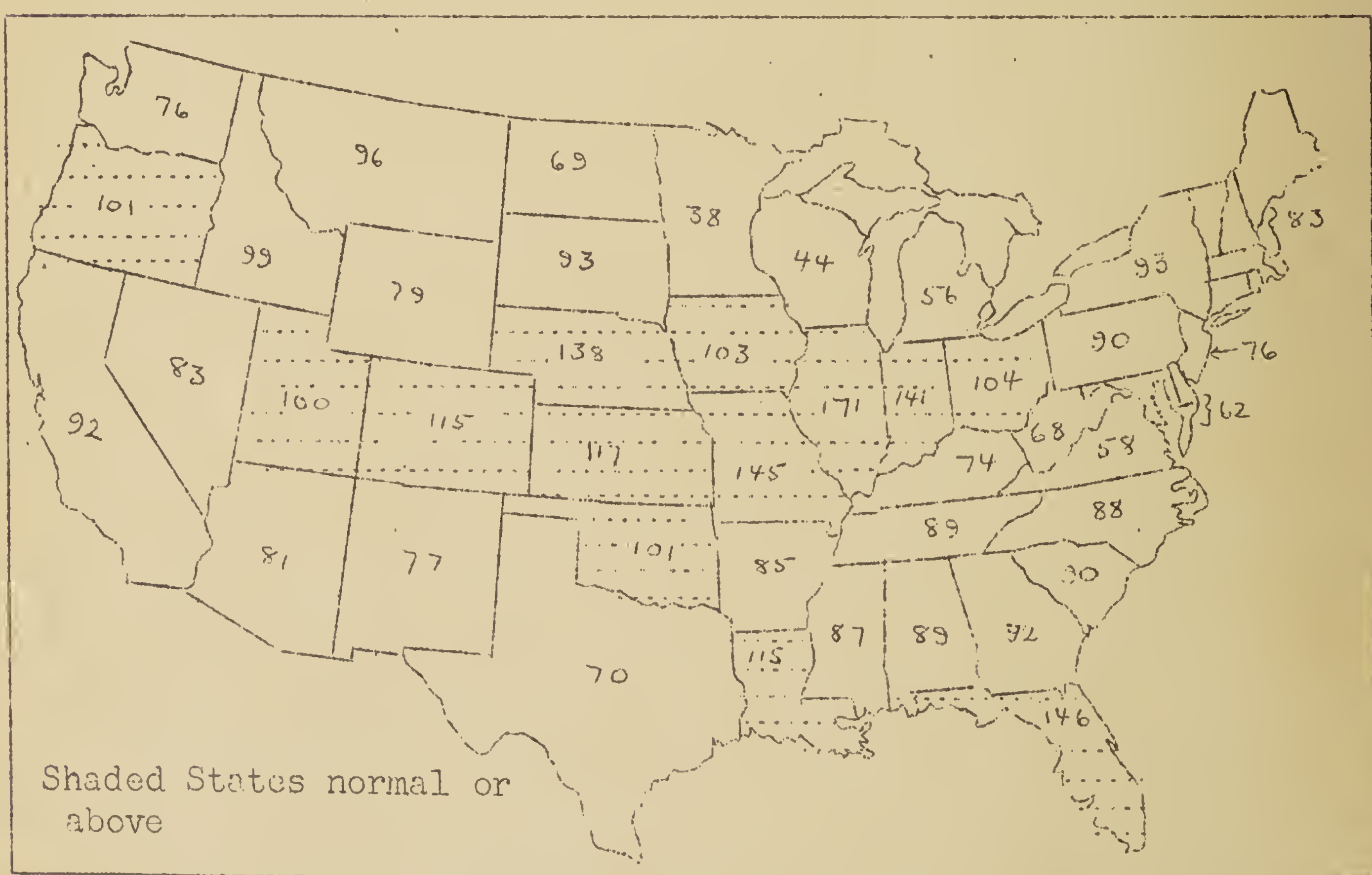

Figure 2--Percentage of Normal Precipitation by States, February 1942.

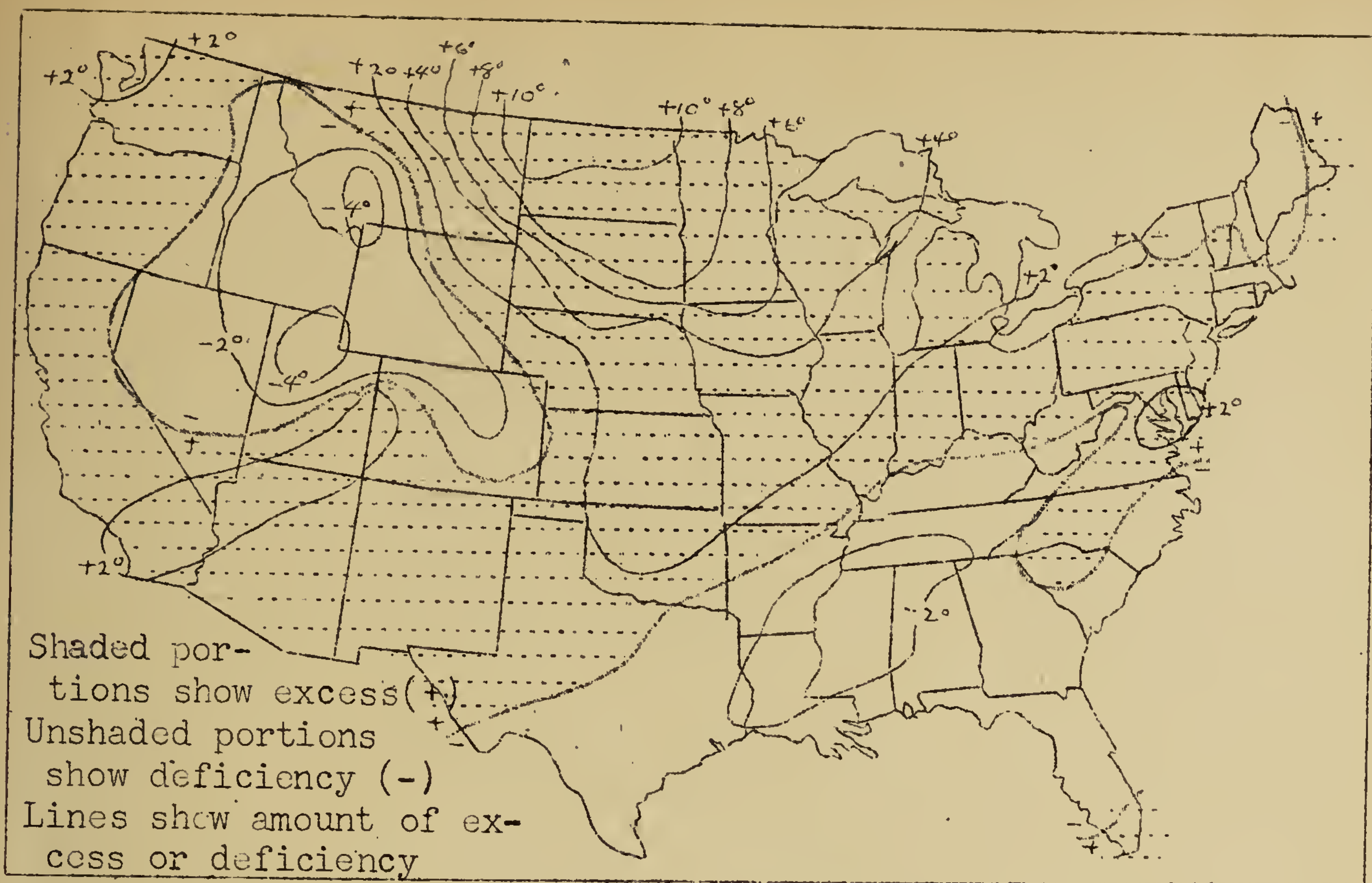

Figure 3--Departure of Mean Temperature from the Normal for the Winter (December-February) 1941-42.

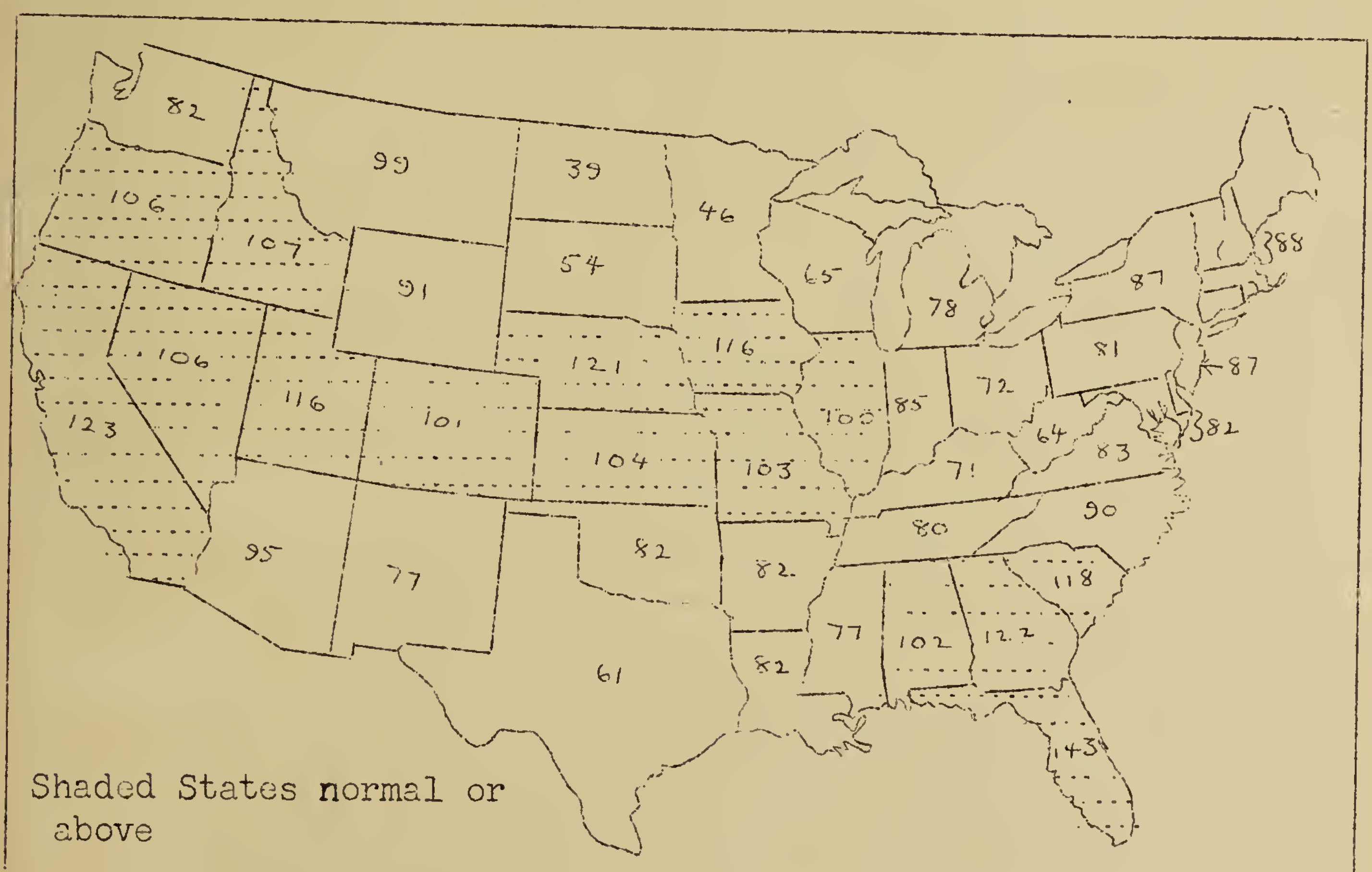

Figure 4--Percentage of Normal Precipitation by States, Winter, December 1941-February 1942.

areas the temperature averaged below normal. From the Lake region westward to the Rocky Mountains and in the lower Missouri and middle Mississippi Valleys the winter as a whole was decidedly warm, especially in the northern Great Plains where some stations reported average temperatures for the season up to 10° or more above normal. The Pacific and middle Atlantic areas had moderately above normal temperatures for the period.

January, with only 67 percent of normal for the country as a whole, and Florida alone having as much as normal rainfall, was by far the driest month of the winter. December was unusually wet in the Southeast, some central midwestern areas, and generally west of the Rocky Mountains. The average for the entire United States for this month was 2.67 inches, or 16 percent above normal. February was relatively dry from the Ohio River southward, eastward, and northeastward, except that heavy rain occurred in Florida (Figure 2). The middle Atlantic area was relatively the driest section of the country; Virginia had only 58 percent of normal and Maryland and Delaware 62 percent. The northern Ohio and central Mississippi Valleys and central Great Plains had more-than-normal precipitation in February, but the States from the Lake region westward had deficiencies. West of the Rocky Mountains only Utah and Oregon had as much as normal. For the country, as a whole, the February average was 1.98 inches, or 92 percent of normal.

Figure 4 shows the percentage of normal for the 3 winter months combined. The Southeast, led by Florida, had above-normal rainfall for the season; also, a few central Midwest States and most of those west of the Rocky Mountains, led by California with 123 percent. On the other hand, the winter had less-than-normal precipitation from the Lake region westward to the Rocky Mountains, as well as in the middle Atlantic area and the States from Arkansas and Louisiana westward to Arizona. For the country, as a whole, the winter average was 6.30 inches, being slightly more than 90 percent of normal.

THE PLANT DISEASE REPORTER

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BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

Volume XXVI April 1, 1942 Number 6

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"Western X-disease" of peach was present in Oregon at least as early as 1935, according to S. M. Zeller, J. R. Kienholz, and C. E. Owens, who report its present distribution and evidence of spread, page 138.

S. M. Zeller and C. B. Cordy report the occurrence of the buckskin virus disease of sweet cherry in southern Oregon, page 141.

Charcoal rot, which is not reported often on potatoes, was prevalent in potato fields in one section of Illinois in 1941, according to G. H. Boewe, page 142.

John T. Presley suggests methods of decreasing the likelihood of damage from cotton rust, such as occurred in Arizona in 1941, page 144.

P. E. Hoppe contributes his ninth annual summary of the prevalence and distribution of corn ear rot fungi, page 145.

Varietal tests show significant differences between rice varieties in their reaction to blast, according to E. M. Cralley and C. R. Adair, page 149.

M. M. Afanasiev and H. E. Morris send current notes on plant diseases in Montana, including the first record of the occurrence of the violet root rot fungus in the State, page 150.

Brief notes, page 152, include summaries by R. S. Kirby and M. A. Smith of the development of the apple scab fungus in Pennsylvania and in Missouri, respectively; a report by George Nyland of a new fungus on Bermuda grass in Louisiana; and a notice of a Connecticut Station Bulletin on meeting the spray material shortage.

Dinitro-ortho-cresol shows promise as an eradicant spray for the control of fruit diseases, according to results with apple scab and raspberry anthracnose in Minnesota reported by E. G. Sharvelle, page 153.

CHECK LIST REVISION

Freeman Weiss

QUERCUS -- continued.

QUERCUS GAMBELII Nutt., under Q. LOBATA.
QUERCUS GARRYANA Dougl., under Q. LOBATA.
QUERCUS GEORGIANA Curtis, under Q. COCCINEA.
QUERCUS HYPOLEUCOIDES A. Camus (Q. hypoleuca Engelm.), under Q. ARIZONICA.
QUERCUS ILLICIFOLIA Wang., under Q. VELUTINA.
QUERCUS IMBRICARIA Michx., under Q. PHELLOS.
QUERCUS LAEVIS Walt., under Q. VELUTINA.
QUERCUS LAURIFOLIA Michx., under Q. PHELLOS.
QUERCUS LOBATA Née, CALIFORNIA WHITE OAK. Tree of Growth Regions 3, 4, & 5, grown for shade & ornament in Calif. Also Q. GAMBELII Nutt. (Q. leptophylla Rydb.), ROCKY MT. WHITE OAK, of G.R.'s 9, 11, 13 & 14; Q. GARRYANA Dougl., OREGON WHITE OAK, of G.R.'s 1 & 2; Q. UNDULATA Torr., ROCKY MT. SHIN OAK, of G.R.'s 9, 11, 13, 14, 16, 17, 20; and Q. SADLERIANA Brown, SADLER OAK, of G.R. 4.

Armillaria mellea Vahl ex Fr., root rot. Oregon.
Coryneum megaspermum Syd., on twigs. Colo.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II, III). Calif.
Cylindrosporium kelloggii Ell. & Ev., leaf spot. Calif.
Dothidella janus (Berk. & Curt.) Höhn., leaf spot. Oregon.
Endothia singularis (Schw.) Shear & N.E.Stevens, on branches. Colo., N.Mex.
Fomes applanatus (Pers. ex Fr.) Gill., butt rot, heart rot. Oregon.
F. everhartii (Ell. & Gall.) Schrenk, white heart rot. Calif., N.Mex
F. igniarius (L. ex Fr.) Kickx., white mottled heart rot. N.Mex., Oregon.
Hymenochaete rubiginosa (Dicks. ex Fr.) Lév., wood rot. Wash.
Lenzites betulina L. ex Fr., wood rot. Calif.
Microsphaera alni DC. ex Wint., powdery mildew. Calif., Oregon, Wash.
M. a. var. calocladophora (Atk.) Salm., Wash.
Mycosphaerella sp., leaf spot. Oregon.
M. caespitosa Ell. & Ev., leaf spot. Calif.
M. spleniata (Cke. & Pk.) House, on fallen leaves. Colo.
Nectria coccinea Pers. ex Fr., on branches. Oregon.
N. galligena Bres., trunk canker. Oregon.
N. punicea Schm. ex Fr. (Cylindrocarpon album var. majus Wr.), on branches. Oregon.
Nummularia clypeus (Schw.) Cke., Oregon, Utah, Wash.
Phoradendron villosum Nutt., mistletoe. Calif., Oregon.
Polyporus dryophilus Berk., white pocket heart rot. Ariz., Calif., Colo., N. Mex., Oregon, Wash.
P. sulphureus Bull. ex Fr., brown cubical heart rot. Calif., Oregon.

QUERCUS -- continued.

Polyporus spp., wood rot, chiefly logs & slash, sometimes on living trees. P. adustus Willd. ex Fr., Oregon; P. cinnabarinus Jacq. ex Fr., N.Mex.; P. dichrous Fr., Wash.; P. fissus Berk., Oregon; P. glomeratus Pk., Oregon; P. hirsutus Wulf. ex Fr., N. Mex.; P. obtusus Berk., N.Mex.; P. unitus Pers., Calif., N. Mex.; P. versicolor L. ex Fr.
Poria spp., chiefly sapwood rot of logs & slash. P. andersonii (Ell. & Ev.) Neuman, Ariz., Calif., Oregon; P. contigua (Pers. ex Fr.) Cke., Oregon; P. ferruginosa Schrad. ex Fr., N.Mex., Oregon; P. mucida Fr., Oregon.
Septoria ocellata (Lév.) Sacc., on leaves. Oregon.
Stereum spp., sapwood or heart rot of logs & timber sometimes on living trees. S. complicatum Fr., Wash.; S. gausapatum Fr., Oregon; S. hirsutum Willd. ex Fr., Oregon, Wash.
Strumella coryneoidea Sacc. & Wint., trunk canker. Oregon.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Calif., Colo., Wyo.

QUERCUS LYRATA Walt., under Q. MACROCARPA.

QUERCUS MACROCARPA Michx., BUR OAK. Forest tree of Growth Regions 15, 16, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30. Also Q. LYRATA Walt., OVERCUP OAK, of G.R.'s 20, 22, 25, 28, 29, 30.

Aleurodiscus oakesii (Berk. & Curt.) Cke., bark patch. Widespread.
Armillaria mellea Vahl ex Fr., root rot. Ill., Minn., Wis.
Articularia quercina (Pk.) Höhn., on leaves. Miss.
Ceratophorum uncinatum (Clint.) Sacc., on leaves. Ill., Ind., Mo.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Okla.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Wis. to Miss., Kans. & S.Dak.
Cylindrosporium microspilum Sacc. & Wint., leaf spot. Ill.
Dothiorella phomiformis (Sacc.) Petr. & Syd., leaf spot. Conn.
Fomes spp., heart rot, butt rot, commonly in living trees. F. applanatus (Pers. ex Fr.) Gill. and F. everhartii (Ell. & Gall.) Schrenk, widespread; F. fraxinophilus Pk., N.Dak., S.Dak.; F. geotropus Cke., La.; F. ohiensis Berk., N.Dak.
Gloeosporium septorioides Sacc., leaf spot. Ill., Nebr., N.Dak.
Gnomonia veneta (Sacc. & Speg.) Kleb., anthracnose, leaf blight. Iowa, Kans., Ky., Wis.
Graphium rubrum Rumbold, wood stain. Ark., Miss.
Hydnum erinaceus Bull. ex Fr., white spongy heart rot. La.
Lentinus tigrinus Bull. ex Fr., sapwood or sometimes heart rot. La.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Wis. to Miss., Kans. & Nebr.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
Microstroma album (Desm.) Sacc., on leaves. Ill.
Mycosphaerella nigrita (Cke.) J.H.Miller, on fallen leaves. Ga., Nebr.
M. spleniata (Cke.& Pk.) House, on fallen leaves. Kans.,Nebr., Wis.

QUERCUS -- continued.

Nummularia clypeus (Schw.) Cke., on branches. N.Dak.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Ill., Miss.
Phyllosticta livida Ell. & Ev., leaf spot. Wis.
P. quercus Sacc. & Speg., Ind., Wis.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora glandicola (Schw.) N.E. Stevens, on twigs, ? canker.
P. quercifolia Ell. & Ev., on leaves. Nebr.
Polyporus dryadeus Fr., white root rot. Minn.
P. dryophilus Berk., white pocket heart rot. Central States to La.
P. sulphureus Bull. ex Fr., brown checked heart rot. Minn.
Polyporus spp., wood rot, chiefly of logs, sometimes heart rot of living trees. P. fissilis Berk. & Curt., La.; P. gilvus (Schw.) Fr., Nebr., N.Dak.; P. hirsutus Wulf. ex Fr., N.Dak.; P. pargamenus Fr., La.; P. versicolor L. ex Fr., N.Dak.; P. zonalis Berk., La.
Sphaerotheca lanestris Harkn., brown mildew. Ill.
Stereum frustulosum Pers. ex Fr., heart rot. N.Dak., S.Dak.
S. rameale Schw., sapwood or sometimes heart rot. La.
S. subpileatum Berk. & Curt., butt rot, white pocket heart rot. La.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Iowa, Wis. Wyo.
Trametes serialis Fr., brown dry rot. Nebr.
Valsa macrocarpa Ell. & Ev., on branches. Kans.
Venturia orbicula (Schw.) Cke. & Pk., on leaves. Kans.

QUERCUS MARILANDICA Muench., under Q. NIGRA.
QUERCUS MICHAUXII Nutt., under Q. PRINUS.
(QUERCUS MONTANA Willd.): Q. PRINUS L.
QUERCUS MUHLENBERGII Engelm., under Q. PRINUS.
QUERCUS MYRTIFOLIA Willd., under Q. PHELLOS.

QUERCUS NIGRA L., WATER OAK. Forest tree of Growth Regions 17, 20, 25, 28, 29, 30; also cult. as shade tree, Zone VI. Including Q. MARILANDICA Muench., BLACKJACK OAK, of G.R.'s 16,19, 20, 22,24,25,27,28,29,30.

Actinopelte japonica Sacc., leaf spot. W.Va.
Armillaria mellea Vahl ex Fr., butt rot. La.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Okla.
Cronartium fusiforme Hedgc. & Long, leaf rust (II,III). N.Car. (Fusiform gall rust (0,I) on long leaf pines)
C. quercuum (Berk.) Miyabe, leaf rust (II,III). Del. to Fla., Ark. & Tenn. (Eastern gall rust (0,I) on various hard pines.)
C. strobilinum Hedgc. & Hahn, leaf rust (II,III) on Q. nigra. Fla. (Cone rust (0,I) on Pinus caribaea and P. palustris.)
Daedalea unicolor Bull. ex Fr., wood rot. Ga.

QUERCUS -- continued.

Dichaena strumosa Fr., branch canker. Ga., N.Car.
Echidnodes liturae (Cke.) Theiss. & Syd., leaf spot. Fla., Texas.
Endothia gyrosa (Schw.) Fr., on branches & exposed roots. N.Car. to Ky., Fla. & La.
Fomes spp., heart rot, often of living trees. F. applanatus (Pers. ex Fr.) Gill., Ind.; F. everhartii (Ell. & Gall.) Schrenk, N.J., Pa.; F. igniarius (L. ex Fr.) Kickx, Va.
Fomes spp., wood rot, usually of logs. F. calkinsii (Murr.) Sacc. & D. Sacc., Fla.; F. fomentarius (L. ex Fr.) Kickx., Va.; F. geotropus Cke., La., Miss.; F. marmoratus (Berk. & Curt.) Cke., Texas; F. robustus Karst., La.
Ganoderma lucidum (Leyss. ex Fr.) Karst., white spongy butt & heart rot. La., Miss., S.Car.
Gloeosporium septorioides Sacc. f. major Ell. & Ev., leaf spot. N.J.
Gnomonia clavulata Ell., on fallen leaves. N.J.
Godroniopsis quernea (Schw.) Diehl & Cash, on branches. Fla.
Hydnum erinaceus Bull. ex Fr., white spongy heart rot. La., Miss.
H. pulcherrimum Berk. & Curt., sapwood rot. Ark., La.
Hypoderma illicinum DeNot., on leaves. Ala., Fla., Ga., Texas.
Hypoxylon atropunctatum (Schw. ex Fr.) Cke., wood rot, trunk canker. Ga., Okla., Pa.
Lentinus tigrinus Bull. ex Fr., sapwood or sometimes heart rot. La., Miss.
Leptothyrium dryinum Sacc., leaf spot. Miss., Texas.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Ala.
Microsphaera alni DC. ex Wint., powdery mildew. N.J. to Ala., La. & Ill.
M. a. var. calocladophora (Atk.) Salm. Ala., Fla., S.Car.
M. a. var. extensa (Cke. & Pk.) Salm. Ohio, S.Car.
Monochaetia desmazierii Sacc., leaf spot. Ark., N.Car., Tenn.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. N.Car.
Mycosphaerella aquatica (Cke.) J.H.Miller, on leaves. Ga., S.Car.
Nectria cinnabarina Tode ex Fr., on twigs. Ala., Ga., Miss.
Nummularia clypeus (Schw.) Cke., on branches. Ga.
Phoma dendritica Thüm., on leaves. S.Car.
Phoradendron flavescens (Pursh) Nutt., mistletoe. N.Car., Texas.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Ala., Ga., Ohio, S.Car.
Phyllosticta spp., leaf spot. P. livida Ell. & Ev., Fla.; P. ludoviciana Ell. & Mart.; and P. marginalis Ell. & Ev., La.
Physalospora glandicola (Schw.) N.E. Stevens, twig canker. Ill.
P. obtusa (Schw.) Cke., on branches. Ala.
Pleurotus ostreatus Jacq. ex Fr., sapwood or sometimes heart rot. La., Miss.
Polyporus dryadeus Fr., root & butt rot. Fla., Okla., Texas.
P. dryophilus Berk., white pocket heart rot. Mo., Okla., Texas.
P. fissilis Berk. & Curt., butt rot, heart rot. Ark., La., Miss.
P. ludovicianus (Pat.) Sacc. & Trott., white pocket heart rot. S. Car. to Ala., La. & Texas.

QUERCUS -- continued.

Polyporus spp., wood rot chiefly of logs, sometimes heart rot of living trees. P. frondosus Dicks. ex Fr., La.; P. gilvus (Schw.) Fr., Ind., La.; P. graveolens (Schw.) Fr., Ala.; P. hirsutus Wulf. ex Fr., Ind.; P. hispidus Bull. ex Fr., Ark., La., Miss.; P. obtusus Berk., N.Car.; P. pargamenus Fr., La., Texas; P. sanguineus L. ex Fr., Fla., Texas; P. sector Ehr. ex Fr., Ark., La.; P. spraguei Berk., Ind., La.; P. sulphureus Bull. ex Fr., Conn., La.; P. unitus Pers., Ill.; P. versicolor L. ex Fr., Texas; P. zonalis Berk., Ark., La.

Poria spp., sapwood rot, sometimes sprout butt rot. P. andersonii Ell. & Ev., Texas; P. contigua (Pers. ex Fr.) Cke., Ind.; P. flavomarginata (Murr.) Sacc. & Trott., La., S.Car.; P. floridana (Murr.) Sacc. & Trott., S.Car.; P. spiculosa Campbell & Davidson, N.Car.

Pseudovalsa lanciformis (Fr.) Ces. & DeNot., on branches. Ga.

Septobasidium spp., felt patch. Numerous spp. reported, especially on Q. nigra, as S. burtii Lloyd, Ga., S.Car.; S. castaneum Burt, Fla., La.; S. mariani Bres., N.Car.; S. pseudopedicellatum Burt, N.Car.; S. sinuosum Couch, La., S.Car.

Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H.Miller, on leaves. Ga.

Stereum gausapatum Fr. and S. subpileatum Berk. & Curt., butt rot, white pocket heart rot. Ark., La. S. fasciatum Schw. and S. fuscum Schrad. ex Quél., Texas.

Strumella coryneoidea Sacc. & Wint., trunk canker. Ill.

Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Va. to Fla., La. & Okla.

Trabutia quercina (Fr. & Rud.) Sacc. & Roum., tar spot. Ala., Miss.

Trametes subnivosa Murr., heart rot. La.

QUERCUS PALUSTRIS Muench., PIN OAK. Forest tree of Growth Regions 21,22, 23, 24, 25, 27, 29; often grown as a street tree, Zone IV. Including Q. ELLIPSOIDALIS E. J. Hill, NORTHERN PIN OAK, of G.R.'s 21,22,23,24; cult. Zone IV.

Armillaria mellea Vahl ex Fr., root rot. Ill.

Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Md., Ga., Wis.

Cylindrosporium microspilum Sacc. & Wint., leaf spot. Ill.

Cytospora chrysosperma Pers. ex Fr., twig canker. N.J.

Endothia gyrosa (Schw.) Fr., on branches & exposed roots. Ga., Ind.

Fomes applanatus (Pers. ex Fr.) Gill. and F. everhartii (Ell. & Gall.) Schrenk., heart rot. Widespread.

Ganoderma curtisii (Berk.) Murr., butt rot. Md.

Gloeosporium septorioides Sacc., leaf spot. Wis.

Gnomonia veneta (Sacc. & Speg.) Kleb., leaf blight. Conn., N.J.

Hymenochaete rubiginosa Lév., wood rot. Ind.

Leptothyrium dryinum Sacc., leaf spot. Va., Wis.

Microsphaera alni DC. ex Wint., powdery mildew. Va. to Ala. & Wis. M. a. var. extensa (Cke. & Pk.) Salm., Ill., Va.

QUERCUS -- continued.

Monochaetia desmazierii Sacc., leaf spot. Kans.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. Ohio.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Ind.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Ill., Ind.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora glandicola (Schw.) N.E. Stevens, twig blight, canker.
Polyporus dryophilus Berk., heart rot. Mo.
Polyporus spp., wood rot, chiefly logs & slash, or sometimes on living trees. P. cinnabarinus Jacq. ex Fr., La.; P. sanguineus L. ex Fr., La.; P. sector Ehr. ex Fr., La.; P. spraguei Berk., Ind., Mass.; P. versicolor L. ex Fr., Ind.
Pseudovalsa longipes (Tul.) Sacc., twig canker. Ill., Mich.
Septobasidium spp., felt patch. S. burtii Lloyd, N.Car.; S. cokeri Couch, N.Car.; S. curtisii (Berk. & Desm.) Boed. & Stein., widespread.
Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H.Miller, on leaves. Ga.
Stereum subpileatum Berk. & Curt., butt & heart rot. Ark., Mo.
Strumella coryneoidea Sacc. & Wint., trunk canker. Conn.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Widespread.
Chlorosis, -- iron or other mineral deficiency, usually in calcareous soil. Widespread.

QUERCUS PHELLOS L., WILLOW OAK. Large tree of Growth Regions 20, 25, 27, 28, 29, 30; extensively planted for shade, Zone V. Including Q. CINEREA Michx., BLUEJACK OAK, of G.R.'s 22,23, 24,25,27,28; Q. IMBRICARIA Michx., SHINGLE OAK, of G.R.'s 16,20,25,28,29,30; and Q. LAURIFOLIA Michx., LAUREL OAK, of G.R.'s 20,28,29,30, cult. Zone VII; and Q. MYRTIFOLIA Willd., MYRTLE OAK, of G.R.'s 17,29,30.

Armillaria mellea Vahl ex Fr., root rot. Fla., La.
Asterina spp., black stromata, mostly superficial, on leaves, chiefly of Q. laurifolia. Fla. (A number of spp. have been described and later were transferred to other genera as Calothyrium, Dictyothyrium, Microthyriella etc.).
Calonectria erubescens (Desm.) Sacc., on leaves of Q. laurifolia. Fla.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Cronartium fusiforme Hedgc. & Long, leaf rust (II,III). On Q. cinerea, Fla. (Fusiform rust (O,I) on long leaf pines.)
C. quercuum (Berk.) Miyabe, leaf rust (II,III). Md. to Fla. & Tenn. (Eastern gall rust (O,I) on various pines.)
C. strobilinum Hedgc. & Hahn, leaf rust (II) on Q. laurifolia, Fla. (Cone rust (O,I) on long leaf pines.)
Endothia gyrosa (Schw.) Fr., on branches. Ga., Ind., N.Car., S.Car.
Fomes applanatus (Pers.ex Fr.) Gill., butt rot, heart rot. Occasional.
F. everhartii (Ell. & Gall.) Schrenk and F. igniarius (L. ex Fr.) Kickx, heart rot. Widespread.

QUERCUS -- continued.

Ganoderma curtisii (Berk.) Murr., butt rot. Va.
G. lucidum (Leyss. ex Fr.) Karst., wound rot, heart rot. La., Miss.
Gloeosporium septorioides Sacc., leaf spot. Ill., Mo., N.J., Ohio.
Godroniopsis quernea (Schw.) Diehl & Cash, on branches. N.Car.
Hydnum erinaceus Bull. ex Fr., white spongy rot. La., Miss., N.Car.
Irenina manca (Ell. & Ev.) F.L.Stevens, black mildew. Miss.
Lentinus tigrinus Bull. ex Fr., sapwood or sometimes heart rot. La., Miss.
Lenzites betulina L. ex Fr., wood rot. Md.
Leptostroma querci Tehon, leaf spot. Ill.
Leptothyrium dryinum Sacc., leaf spot. Kans., N.Car. S.Car.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Md.
Melasmia quercuum Atk., on leaves. Ala.
Microsphaera alni DC. ex Wint., powdery mildew. Md. to Fla. & Ill.
M. a.var. calocladophora (Atk.) Salm., Ala., Fla., S.Car.
M. a. var. extensa (Cke. & Pk.) Salm., Fla., Mo.
Microstroma album (Desm.) Sacc., on leaves. Mo.
Monochaetia desmazierii Sacc., leaf spot. Fla.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. Fla., Ga., N.Car.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Ala.
Phyllosticta vesicatoria Thüm., on insect galls. S.Car.
P. neuroterigallicola Tehon, Ill.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Polyporus dryophilus Berk., white pocket heart rot. La., Mo., Texas.
P. fissilis Berk., butt rot, white pocket heart rot. Ark., La., Miss.
P. ludovicianus (Pat.) Sacc. & Trott., heart rot. Gulf States.
Polyporus spp., wood rot, sometimes of living trees. P. gilvus (Schw.) Fr., La.; P. hirsutus Wulf. ex Fr., Texas; P. hispidus Bull. ex Fr., La., N.Y., N.Car.; P. sulphureus Bull. ex Fr., La.; P. versicolor L. ex Fr., Texas.
Poria cocos (Schw. ex Fr.) Wolf, root rot. Fla.
P. floridana (Murr.) Sacc. & Trott., Ark., Fla., S.Car.; P. spiculosa Campbell & Davidson, trunk canker, heart rot. Del., N.Car., Va.
Pseudovalsa longipes (Tul.) Sacc. (Coryneum kunzei Cda.), twig canker. Iowa.
Septobasidium spp., felt patch. S. alni Torrend, N.Car.; S. apiculatum Couch, Ark., N.Car.; S. burtii Lloyd, N.Car.; S. castaneum Burt, S.Car.; S. cokeri Couch, N.Car., Tenn.; S. curtisii (Berk. & Desm.) Boed. & Stein., Ark.
Septoria neglecta Earle, leaf spot. Ala.
S. serpentaria Ell. & Mart., leaf spot of Q. laurifolia. Fla.
Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H.Miller, on leaves of Q. cinerea. Ga.
Stereum spp., heart rot of living trees, also general wood rot. S. fasciatum Schw., Texas; S. frustulosum Pers. ex Fr., Ind.; S. subpileatum Berk. & Curt., Ark., Miss.

QUERCUS -- continued.

Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Va. to Fla. & Miss.
Trabutia erythrospora (Berk. & Curt.) Cke. and T. quercina (Fr. & Rud.) Sacc. & Roum., tar spot. Fla., Miss., Texas.
Venturia asterinoides Ell. & Mart. and V. cupulata Ell. & Mart., on leaves of Q. laurifolia. Fla.
Leprosis (scaly bark), -- cause unknown. On Q. laurifolia, Fla.

QUERCUS PRINUS L. (Q. montana Willd.), CHESTNUT OAK. Forest tree of Growth Regions 20,22,24,25,26,27,28,29,30. Including Q. MICHAUXII Nutt. (Q. prinus L. according to some authorities), SWAMP CHESTNUT OAK (basket oak), of G.R.'s 20, 25,28,29,30; Q. MÜHLENBERGII Engelm., CHINQUAPIN OAK of G.R.'s 11,16,20,21,22,23,24,25,27,28,29,30; and Q. PRINOIDES Willd., DWARF CHINQUAPIN OAK, of G.R.'s 21,22,23,24,25,27, 28,29,30.

Actinopelte japonica Sacc., leaf spot. N.J., W.Va.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Okla.
Coryneum pustulatum Pk. (=C. kunzei Cda.?), on twigs. Md.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Ga., Kans., Md., W.Va.
Cytospora sp., dieback. N.J.
Daedalea quercina L. ex Fr., brown checked heart rot. Widespread.
Dichaena strumosa Fr., branch canker. W. Va.
Diplodia longispora Cke. & Ell., twig blight, sometimes general blight. Conn. to N.Car. & Ill. (The same or a similar disease has been ascribed to Dothiorella quercina (Cke. & Pk.) Sacc., the conidial stage of Physalospora glandicola (Schw.) N.E.Stevens, and also to Sphaeropsis malorum Pk., conidial stage of P. obtusa (Schw.) Cke.)
Dothiorella phomiformis (Sacc.) Petr. & Syd., leaf spot. Kans., Md., N.Y., W.Va.
Endothia gyrosa (Schw.) Fr., on branches. Ind.
E. parasitica (Murr.) P.J. and H.W. And., twig blight. Md.
Fomes annosus (Fr.), wood rot. Pa.
F. everhartii (Ell. & Gall.) Schrenk, white spongy heart rot. N.Car.
F. igniarius (L. ex Fr.) Kickx, heart rot. Va.
Gloeosporium septorioides Sacc., leaf spot. Miss.
Gnomonia veneta (Sacc. & Speg.) Kleb., leaf blight. Conn., N.J., W.Va., Wis.
Hydnum ochraceum Pers. ex Fr., wood rot. Ala., Ind.
Leptothyrium castaneae (Spreng.) Sacc., var. quercus C. Massal., leaf spot. Va.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Pa. to Miss., Kans. and Wis.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
Monochaetia desmazierii Sacc., leaf spot. Fla., N.Car., Tenn.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. Fla., Ga.

QUERCUS -- continued.

Mycosphaerella maculiformis (Pers. ex Fr.) Schroet., on fallen leaves. Widespread. The conidial stage, Phyllosticta maculiformis Sacc., appears on aging leaves in autumn.
M. punctiformis (Pers. ex Fr.) Schroet. and M. spleniata (Cke. & Pk.) House, on fallen leaves. Ga., N.Y.
Nectria galligena Bres., trunk canker. Conn.
Phomopsis quercinum (Sacc.) Höhn., twig canker. Va. (Conidial stage of Diaporthe leiphaemia var. raveneliana ?)
Phyllosticta quercus-prini Ell. & Ev., on leaves. West Va. (See also Mycosphaerella.)
Physalospora glandicola (Schw.) N.E.Stevens (Dothiorella quercina (Cke. & Ell.) Sacc.), branch canker. Ill.
Phytophthora cinnamomi Rands, seedling blight. Md.
Polyporus dryadeus Pers. ex Fr., root rot. Md., Texas.
P. dryophilus Berk., white pocket heart rot. Pa. to N.Car. & Texas.
P. hispidus Bull. ex Fr., trunk canker, heart rot. Conn., Va.
P. spraguei Berk., heart rot. Ind.
Polyporus spp., wood rot, chiefly of logs, sometimes of living trees. P. frondosus Dicks. ex Fr., N.Y.; P. gilvus (Schw.) Fr., N.Y.; P. hirsutus Wulf. ex Fr., widespread; P. hispidus Bull. ex Fr., N.Y.
Pseudovalsa longipes (Tul.) Sacc. (Coryneum kunzei Cda.), twig canker. N.J., Pa.
P. sigmoidea (Cke. & Ell.) Sacc., on twigs. W.Va.
Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H.Miller, on leaves. Ga.
Sphaerotheca lanestris Harkn., brown mildew. Miss.
Stereum subpileatum Berk. & Curt., white pocket heart rot. Va.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Ga.
Venturia orbicula (Schw.) Cke. & Pk., on leaves. N.Y. to Ohio & Va.

QUERCUS ROBUR L., ENGLISH OAK. Large tree of European region, cult. in many hort. forms, Zone IV. Including a few records on other exotic oaks, as Q. SUBER L., CORK OAK, sometimes cult. in Calif.

Colpoma quercina (Pers. ex Fr.) Wallr., branch canker. Pa.
Cytospora chrysosperma Pers. ex Fr., twig canker. N.J., R.I.
Daedalea quercina L. ex Fr., brown checked heart rot. N.Y.
Heterodera marioni (Cornu) Goodey, root knot. Calif. On Q. suber.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Ind., Va.
Microsphaera alni DC. ex Wint., powdery mildew. Conn., Ill., Ind., N.Y.
Nummularia clypeus (Schw.) Cke., on branches. Md.
Physalospora glandicola (Schw.) N.E.Stevens (Dothiorella quercina (Cke. & Ell.) Sacc.) branch canker. Md., Ohio.

QUERCUS SADLERIANA Brown, under Q. LOBATA.
QUERCUS SHUMARDII Buckl., under Q. FALCATA.

QUERCUS -- continued.

QUERCUS SINUATA Walt., under Q. ARIZONICA.
QUERCUS STELLATA Wangh., under Q. ALBA.
QUERCUS SUBER L., under Q. ROBUR.
QUERCUS TEXANA Buckl., under Q. FALCATA.
QUERCUS TOMENTELLA Engelm., under Q. CHRYSOLEPIS.
QUERCUS UNDULATA Torr., under Q. LOBATA.

QUERCUS VELUTINA Lam., BLACK OAK. Forest tree of Growth Regions 20, 22,23,24,25,26,27,28,29,30. Including Q. LAEVIS Walt., TURKEY OAK, of G.R.'s 29 & 30; and Q. ILLICIFOLIA Wangh., SCRUB OAK, of G.R.'s 22,25,26,27,28.

Actinopelte japonica Sacc., leaf spot. N.J.
Armillaria mellea Vahl ex Fr., root rot. Widespread.
Articularia quercina (Pk.) Höhn., on leaves. Ill., Miss.
Bulgaria inquinans Pers. ex Fr., on branches. Ala., Conn., N.Y., Va.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Conn. to Fla., Miss. & Minn.
Cytospora pallida Ell. & Ev., on branches. N.J.
Daedalea quercina L. ex Fr., brown checked heart rot. General.
Dichaena quercina Pers. ex Fr. and D. strumosa Fr., twig canker. N.J., Va.
Endothia gyrosa (Schw.) Fr., on branches & exposed roots. N.Car. to Ala., Ark. & Ind.
Fomes applanatus (Pers. ex Fr.) Gill., F. calkinsii (Murr.) Sacc. & D. Sacc. and F. lobatus (Schw.) Cke., sprout butt rot, heart rot. Occasional.
F. everhartii (Ell. & Gall.) Schrenk and F. igniarius (L. ex Fr.) Kickx, heart rot. Widespread.
Ganoderma curtisii (Berk.) Murr. and G. lucidum (Leyss. ex Fr.) Karst., sprout butt & heart rot. Pa. to Ga. & Tenn.
Gloeosporium septorioides Sacc., leaf spot. Mich., Wis.
Gnomonia veneta (Sacc. & Speg.) Kleb., leaf blight. Conn., N.J.
Godroniopsis quernea (Schw.) Diehl & Cash, on branches. N.J.
Hydnum erinaceus Bull. ex Fr., heart rot. Va. to Ga. & Tenn.
Hypoxylon atropunctatum (Schw. ex Fr.) Cke., wood rot. Ga., Ill., Va.
Leptosphaeria dryophila (Cke. & Höhn.) Sacc., on leaves. N.Car.
Leptothyrium dryinum Sacc., leaf spot. N.Car.
Marssonina martini (Sacc. & Ell.) P. Magn., leaf spot. Kans., Ind., Me., Va.
M. quercus (Pk.) P. Magn., leaf spot (of Q. illicifolia). N.Y.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
Monochaetia desmazierii Sacc., leaf spot. Mass., N.Car., Tenn., Fla.
Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. Ga., N.Car.
Mycosphaerella catesbeyi (Cke.) J.H.Miller, on leaves. Ga., S.Car.
Myxosporium stellatum Dearn., on twigs. N.Y.
Nectria galligena Bres., trunk canker. W.Va.

QUERCUS -- continued.

Nummularia clypeus (Schw.) Cke., on branches. N.Y., Va.
Phoradendron flavescens (Pursh) Nutt., mistletoe. S.E. & Gulf States.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Occasional.
Physalospora glandicola (Schw.) N.E. Stevens, on branches. Ill.
P. obtusa (Schw.) Cke., N.Car.
Polyporus dryadeus Pers. ex Fr., root & butt rot. N.Y. to Md., Ark., Texas.
Polyporus spp., white pocket heart rot, typically of living trees. P. berkeleyi Fr., Pa., Va.; P. croceus Pers. ex Fr., Ark., Mo., Va.; P. dryophilus Berk., Pa. to N.Car. & Texas; P. graveolens (Schw.) Fr., Ga., Ohio; P. hispidus Bull. ex Fr., N.Y., Va.; P. obtusus Berk., Va. to S.Car.; P. spraguei Berk., Pa. to N.Car. & Ind.; P. sulphureus Bull. ex Fr., widespread.
Polyporus spp., wood rot chiefly of logs, sometimes sapwood or heart rot of living trees. P. adustus Willd. ex Fr., N.Y., P. caesius Schrad. ex Fr. , Pa., N.Car.; P. cinnabarinus Jacq. ex Fr., widespread; P. epileucus Fr., N.Y.; P. frondosus Dicks. ex Fr., Pa., N.Car.; P. gilvus (Schw.) Fr., N.Y.; P. hirsutus Wulf. ex Fr., N.Y.; P. poculum (Schw.) Berk. & Curt., Mo., Pa., Va.; P. rutilans Pers. ex Fr., N.Y.; P. semisupinus Berk. & Curt., Mass.; P. versicolor L. ex Fr., widespread.
Pseudovalsa longipes (Tul.) Sacc. (Coryneum kunzei Cda.) twig canker. Ark., Iowa, R.I.
P. sigmoidea (Cke. & Ell.) Sacc., on branches. Ga., N.J.
Septobasidium cokeri Couch, felt patch. N.J.
Septoria dryina Cke., leaf spot. Kans.
S. querceti Thüm., S.Car.
Sphaerognomonia polystigma (Ell. & Ev.) Thompson & J.H. Miller, on leaves. Ga.
Sphaeropsis linearis Pk., on branches. N.Y.
Stereum gausapatum Fr., S. subpileatum Berk. & Curt. and S. frustulosum Pers. ex Fr., sprout butt rot, white pocket heart rot. Widespread.
Strumella coryneoidea Sacc. & Wint., trunk canker. N.E. States.
Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. Widespread.
Venturia asterinoides Ell. & Mart., on leaves. Ga.

QUERCUS VIRGINIANA Mill., LIVE OAK. Large evergreen tree of Growth Regions 11,16,17,20,25,29,30,31; frequently planted for shade, Zone VII. Several geographic and ecological vars. some of which are shrubs, are recognized.

Aleurodiscus acerinus (Pers.) Höhn. & Litsch., bark patch. Texas.
Ascochyta quercuum (Cke.) Sacc., on leaves. Miss.
Botryosphaeria quercuum (Schw. ex Fr.) Sacc., on branches. Ga.
Cercospora polytricha Cke., on leaves. Ga., S.Car.
Coryneum sp., twig blight. Texas.
Cronartium quercuum (Berk.) Miyabe, leaf rust (II,III). Va. to Fla. and Texas. (Eastern gall rust, O,I on various hard pines.)

C. strobilinum Hedgc. & Hahn, leaf rust (II,III). Fla., Ga., Miss. (Cone rust; O,I on Pinus caribaea and P. palustris.)

Cuscuta exaltata Engelm.,dodder (on seedlings). Texas.

Daedalea ambigua Berk., wood rot. Ga., La.

Dothidella janus (Berk. & Curt.) Höhn., on leaves. Fla., Texas.

Endothia gyrosa (Schw.) Fr., on branches. Fla., Ga., Miss.

Fomes spp., heart rot, often of living trees. F. calkinsii (Murr.) Sacc. & D. Sacc.; Fla., N.Car.; F. igniarius (L. ex Fr.) Kickx., Fla.; F. marmoratus (Berk. & Curt.) Cke., Fla.

Ganoderma curtisii (Berk.) Murr. and G. lucidum (Leyss. ex Fr.) Karst., white spongy heart rot. Fla., Texas.

Godroniopsis quernea (Schw.) Diehl & Cash, on branches. Ala., Fla.

Hymenochaete rubiginosa (Dicks. ex Fr.) Lév., wood rot.

Lentinus lecomtei Schw., sapwood rot. Fla.

Microsphaera alni DC. ex Wint., powdery mildew. Fla., Texas.

Monochaetia desmazierii Sacc., leaf spot. Fla., Tenn., Texas.

M. taphrinicola (Ell. & Ev.) Sacc., La.

Morenoella quercina (Ell. & Mart.) Theiss., leaf blotch. S.Car. to Fla. & La.

Mycosphaerella aquatica (Cke.) J.H.Miller, on leaves. Ga.

M. caespitosa Ell. & Ev., on leaves. Texas.

Passalora melioloides Tr. & Earle, on leaves. Fla., S.Car.

Phomopsis glandicola (Lév.) Grove (? P. quercina (Sacc.) Höhn), on acorns. Fla.

Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.

Phyllosticta quercus-ilicis Sacc., leaf spot. Miss.

P. virens Ell. & Langl., La., Miss.

Polyporus dryophilus Berk., white pocket heart rot. Texas.

P. sulphureus Bull. ex Fr., brown checked heart rot. Fla., S.Car., Texas.

Polyporus spp., sapwood or sometimes heart rot. P. gilvus (Schw.) Fr., Fla., Texas; P. ludovicianus (Pat.) Sacc. & Trott., La.; P. rhipidium Berk., La.; P. supinus Sw. ex Fr., Ala., Fla., La.; P. unitus Pers., Fla., S.Car.

Pseudovalsa sigmoidea (Cke. & Ell.) Sacc., on branches. Texas.

Stagonospora virens Ell. & Mart., on leaves. Fla.

Stereum fasciatum Schw. and S. subpileatum Berk. & Curt., white pocket rot. Fla.

Taphrina caerulescens (Desm. & Mont.) Tul., leaf blister. N.Car. to Fla. & Texas.

Trabutia erythrospora (Berk. & Curt.) Theiss. & Syd., tar spot. Texas.

T. quercina (Fr. & Rud.) Sacc. & Roum., Fla., Miss. S.Car.

QUERCUS WISLIZENII A.DC., under Q. AGRIFOLIA.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

WESTERN X-DISEASE OF PEACH IN OREGON

S. M. Zeller, J. R. Kienholz, and C. E. Owens

It is the purpose to report here our general surveys of western X-disease in Oregon during the seasons of 1940 and 1941, and to present indications of spread of the disease.

In Oregon this disease was first recognized in an orchard in Wasco County. It was suspected that one branch of peach from this orchard seen in the fall of 1939 might be affected with the disease described by Stoddard in Connecticut the year previous. At the time most affected trees in this orchard were without leaves, however, and the situation was also clouded by the isolation of *Verticillium alboatrum* from 2 trees, and wood-rotting fungi from others. The latter, at least, were undoubtedly secondary invaders. During 1940 this orchard was under observation, at intervals from March 20 until after typical symptoms appeared.

Observations during the season indicated that leaf symptoms suitable for diagnostic purposes were present on diseased trees about 6 to 8 weeks previous to harvest or 70 to 75 days after the trees were in full bloom. About this time, Dr. H. Earl Thomas of the University of California saw an infected peach tree near Mosier, Wasco County. He believed the symptoms were very similar to, if not identical with, those described for "leaf-casting yellows" in California (4), which is believed to be the same as the yellow-red virosis or X-disease of peach and the buckskin disease of sweet cherries (1). In rapid succession, several orchards in Wasco County were found to show more or less infection of the disease. Many orchards, however, were evidently without the disease.

Certain individual clumps and trees of the chokecherry (*Prunus virginiana* var. *demissa*) in Wasco County were found in the summer of 1940 to have red leaves similar to those described for X-disease of chokecherry in eastern States.

It was now realized that the disease had been in Wasco County at least as early as 1935, but the casual observations of 1938-1939 indicated it was not extremely serious during those years.

A 20-acre tract of peaches was mapped on July 8, 1940, to show individual trees infected and the approximate location of diseased limbs in each tree. Another map of the same orchard was prepared from a survey of the infected trees in July 1941. An idea of the serious nature of the disease and its rapid spread may be gained from the above statements and the results of these two surveys as summarized in the following table.

It will be seen that increase in infection is rapid under eastern Oregon conditions, and that in this case the disease involved 33.7% of the trees. In certain orchards in other parts of Oregon up to 90% of the trees have been found infected with the X-disease.

The field symptoms of the disease on peach in Wasco County are typical of those in other counties of eastern Oregon, with two exceptions: First, as Zeller and Evans (5) have mentioned, another set of symptoms referred to as marginal leaf spot of Rochester peach appears farther east in the Columbia Basin of Oregon; this set of symptoms may prove not to be related to the western X-disease. A second set of leaf symptoms including

Results of surveys of western X-disease on peach trees in an Oregon orchard, seasons of 1940 and 1941.

Year	Total trees (Number)	Infected trees (Number)	Standing trees infected (Percent)	Other trees possibly infected (Number)	Trees pulled or missing */ (Number)	Healthy trees (Number)	Increase 1940 to 1941: Infected plus pulled trees (Number)	Increase 1940 to 1941: Probable increase in infection (Percent)
1940	1476	316	21.4	8	22	1152	--	--
1941	--	393	28.6	3	126	976	181	57.3

*/ The trees were removed, according to the owner, because of their diseased condition, undoubtedly due to X-disease.

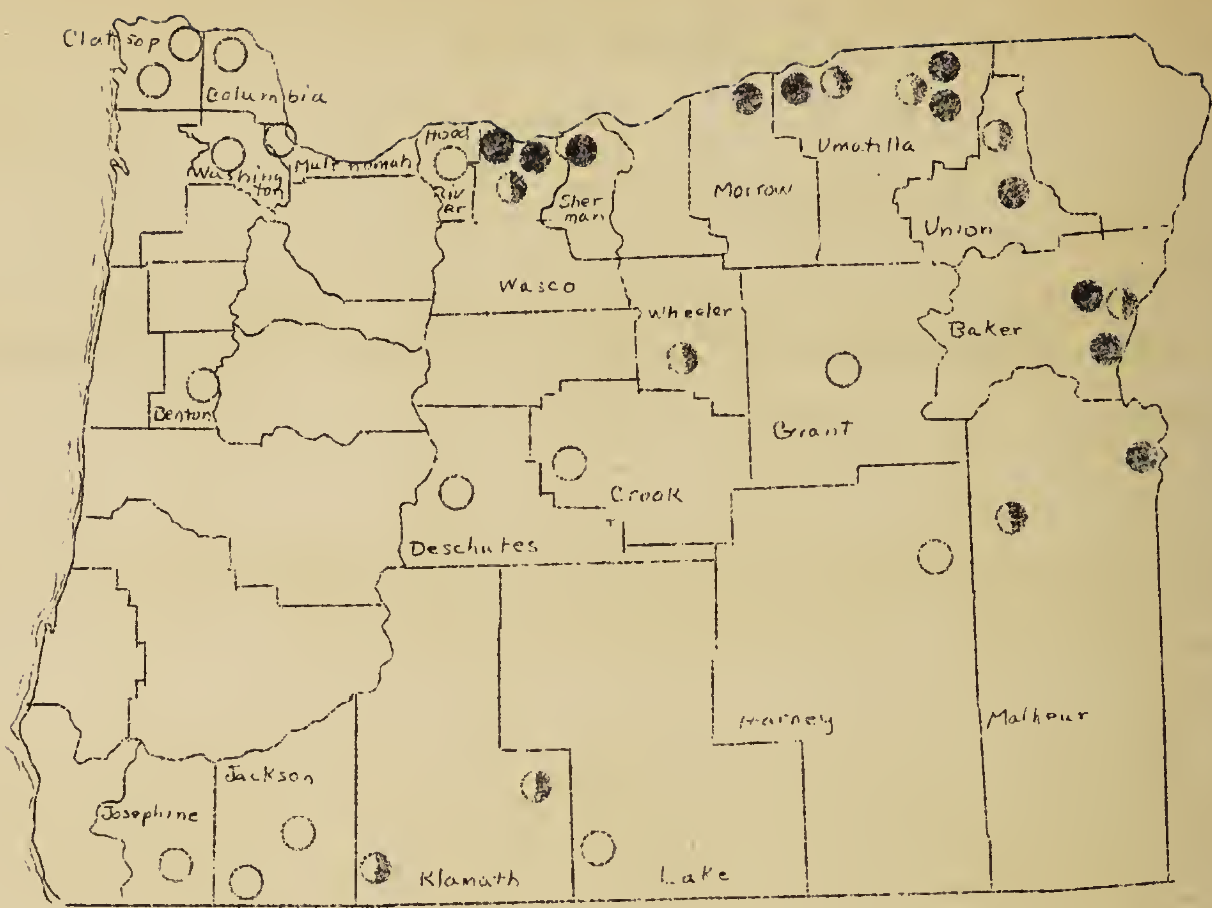
a golden yellow coloration was observed in two locations of eastern Baker County and in Malheur County in 1940. By July 1941 most of these trees had been removed. We first thought these trees infected with X-disease to have been also affected by alkaline soils but later realized the symptoms were similar to those described by Reeves and Hutchins (2) as "Group 2", and by Richards and Hutchins (3).

Typical western X-disease as observed in Wasco County, and which seemingly has two components (5), was observed in peach trees in Baker, Malheur, Sherman, Umatilla, and Wasco Counties in 1940. Union and Morrow Counties were added to the list in 1941. The accompanying map (figure 1) indicates the known present distribution of the disease in Oregon on peach and chokecherry; also the distribution of chokecherry in counties where X-disease has not yet been found.

Chokecherries with red leaf symptoms were usually found in districts where the disease of peach exists. However, some of the most severe cases in peaches were several miles from known chokecherries. In Union County in 1941, both red and yellowish symptoms were discovered in chokecherry. In Baker County the leaves of some chokecherries that showed yellowish symptoms in 1940 were red in 1941.

The spread of the X-disease of peach from 1940 to 1941 was followed in Baker, Malheur, and Umatilla Counties as well as in Wasco County. The rate of spread seemed about the same in all cases.

Our observations indicate that very young peach orchards are not infected even in the neighborhood of or adjoining older infected blocks. Many such instances have been found in Oregon. This would indicate that perhaps the X-disease has not been disseminated through nursery stock. The fact that young trees usually have not shown infection may be related, however, to some factor such as incidence of original infection within an infection area, and there is also the possibility that under natural conditions the incubation period may be of long duration. At any rate this condition should not be interpreted as indicating that young trees are not susceptible.



● Peach infected with X-disease
◑ Infected chokecherry
○ Healthy chokecherry in counties where X-disease has not been found.

Figure 1.--Distribution of X-disease in Oregon.

Buckskin disease of sweet cherries has not been surely diagnosed in Oregon [but see article by Zeller and Cordy following]. Fruit symptoms of the Napoleon variety similar to those described for buckskin are not accompanied by tree and leaf symptoms in Wasco County. This condition in that locality may be due to drouth rather than to the buckskin disease.

Varieties of peach found naturally infected with the western X-disease in Oregon are: Alta Loma (a selection of J. H. Hale); Crawford; both Early and Late; Elberta; Golden Jubilee; J. H. Hale; Improved Elberta; Lemon Cling; Muir; Orange Cling; Orange Seedling; Rio Oso Gem; Rochester; Salwey; South Haven, Slappey; Waldo; and Weber's Special (a local variety).

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(OREGON AGRICULTURAL EXPERIMENT STATION AND U.S. DEPARTMENT OF AGRICULTURE, BUREAU OF PLANT INDUSTRY COOPERATING.)

BUCKSKIN DISEASE OF CHERRY IN SOUTHERN OREGON

S. M. Zeller and C. B. Cordy

In the early summer of 1940 a peculiar disease of sweet cherries which had been noticed in 1939 reappeared on 4 trees in the Ashland district of Jackson County, Oregon. Napoleon (Royal Anne) and Bing trees were affected. The disease starts in one branch and spreads through the affected trees. The fruit turns white at about half maturity and does not ripen. The leaves become yellow along the main veins, especially from the base upward, and some of the veins turn pinkish on the under surface. Early in the summer of 1941 several additional trees were infected in the same orchard, and one tree near Talent and one east of Medford showed symptoms similar to those at Ashland.

There is considerable bronzing of the leaves in mid-summer, and the internodes are shorter than normal resulting in a rosetted appearance especially at the ends of the branches. In the fall infected trees may send out compact tufts of small leaves from the terminal buds while the terminal buds of healthy trees appear dormant. Severely affected branches may die and sometimes the entire tree dies.

This condition is similar to the Napa Valley type of the buckskin disease described by Rawlins and Thomas.[1/] Bark samples from the infected trees at Ashland have given phloroglucin tests for buckskin. Such tests have been verified by Dr. Thomas.

No peach trees infected with the western X-disease have been found in Jackson County.

(OREGON AGRICULTURAL EXPERIMENT STATION AND EXTENSION SERVICE).

1/ Rawlins, T. E., and H. Earl Thomas. The buckskin disease of cherry and other stone fruits. Phytopath. 31:916-925. 1941.

CHARCOAL ROT ON POTATOES IN ILLINOIS

G. H. Boewe

On July 1, 1941, charcoal rot, caused by Rhizoctonia bataticola (Taub.) Butl., was discovered on potato plants in the truck garden area near East St. Louis, Illinois. This is the first record of this disease on this host in this State.

All of the potato fields examined in this region, both in the American Bottoms of Madison County and on the rolling upland soil of Monroe County, were found to have affected plants. Charcoal rot was observed also in LaSalle County, but was not found in 2 potato plantings examined in Calhoun and Cass Counties, the former on upland loess soil, the latter on Illinois River bottom soil. In diseased fields in which counts were made, an average of 19.7% of the hills were attacked. Diseased hills per field ranged from a trace in 2 plantings examined in LaSalle County to 48.8% in 1 field in Monroe County. In most cases every stem of the hill was attacked, although in a few instances 1 or 2, very rarely 3, stems appeared to be healthy.

In Madison County the prevalence of diseased hills varied greatly in different fields, ranging from 6.3 to 31.0%. Approximately 11% of the hills in all fields examined in this county were found to be diseased. In Monroe County the range of infection was small. In the 2 fields examined, 47.0 and 48.8% of the hills were found attacked. However, a wide variation in the number of diseased hills existed in the second of these fields, an average of 61.3% of the hills being diseased in the portion of the field not covered with straw and an average of 36.3% in the strawed portion. In one set of 100 consecutive hills in the unstrawed area, 88 diseased hills were found, and in another set of 100 consecutive hills in the strawed area, 45 diseased hills were found.

Infection appeared either to have occurred at different dates in different fields or to have progressed more rapidly in some fields than in others. In one field in Madison County, nearly all the affected plants were dead, and appeared to have been dead for a long time, when the field was examined on July 1. In another field in the same county, examined on the same day, only a part of the affected plants were dead, and the dead plants appeared not to have been dead for long. Hills prematurely killed by the disease produced a low yield of small tubers.

The size of the sclerotia found on potato stems ranged from 43.2 to 83 mu in width and from 49.8 to 106.2 mu in length. The average size of 100 sclerotia was 66.1 x 77.4 mu, which is well below the maximum mean of 120 mu permitted for inclusion in Haigh's (5) C grouping. Pure cultures from potato stems were grown on potato dextrose agar, and were transferred to Petri plates containing germinated corn and soybean seeds. Under these conditions the fungus readily attacked both kinds of seedlings and killed them.

Although this is the first record of charcoal rot on potatoes in Illinois, it is not the first report of its occurrence on this host. A brief review of the literature shows that charcoal rot has occurred on potato elsewhere in the United States as well as in other parts of the

world. In 1927 Boyd (2) reported a severe tuber, stem and root rot of potatoes in Georgia. He attributed the rot to a Macrophoma that was very common that year on snap beans in the southern part of the State. Also, in 1942 Bratley and Wiant (3) reported isolating Rhizoctonia bataticola (Taub.) Butl. from a few California potato tubers received on the Buffalo market in mid-July, 1941.

In addition to these records from the United States, charcoal rot has been reported in association with tuber rot, wilt or blight of potatoes in Morocco (1), India (4,6), Cyprus (7), Palestine (8), Greece (9), Uganda (10) and Bombay (11). I am indebted to the Division of Mycology and Disease Survey, U. S. Bureau of Plant Industry, for most of the literature references to this disease on potato and am appending them for the convenience of other workers.

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(SECTION OF APPLIED BOTANY AND PLANT PATHOLOGY, ILLINOIS NATURAL HISTORY SURVEY, URBANA, ILLINOIS).

COTTON RUST IN ARIZONA

John T. Presley

Attacks of cotton rust occurred over a large area of Arizona in 1941. The fungus was observed doing serious damage in the Continental and Sahuarita districts south of Tucson; in the Eloy district east of Casa Grande, and in Hidden Valley, southwest of Casa Grande. The increased damage caused by the disease was undoubtedly due to the unusually favorable weather conditions for dissemination of the disease during 1941 and to the increased acreage of cotton on desert land.

Recent investigations at the U. S. Field Station, Sacaton, Arizona, have shown that the Bouteloua grasses, variously known as "six-weeks grama," "needle grama" and "rothrock grama," are alternate hosts of the cotton rust fungus.1/ These grasses are native to the Southwest and can be expected to grow abundantly on most desert lands when water is supplied, either by irrigation or by natural rainfall. Under natural conditions the grass springs up, grows and dies within a relatively short period as indicated by the name "six-weeks grama." On ditch banks and in cotton fields where moisture is available over longer periods the grass will grow for most of the summer and reach a size many times that of desert grown specimens. It is on this grass, in and immediately surrounding the cotton field, that the greater amount of rust inoculum is built up. As soon as a rainy period occurs the telia on the rusted grass germinate and the cotton becomes infected.

It is true that the grass becomes rusted at some distance from a cotton field, but the amount of rust is always greater on the grass growing in or near a field of cotton. Since the fungus cannot spread from cotton to cotton, it seems obvious that removal of the grass would eliminate a large amount of infectious material.

Grass that is growing in a cotton field may become infected early in the summer and reinfect the same cotton field later during the same growing season if weather conditions are favorable. This condition is possible because the telia which form on the grass soon after infection, are immediately viable and will germinate within 48 hours under suitable conditions. Cotton seedlings growing in the greenhouse became rusted within a week following inoculation with telial material from live grass.

Possibilities for Control

The recent completion of life history studies for this rust forms a basis for postulating the following suggestions that should prove helpful in controlling serious outbreaks.

If the dead grass in and around a cotton field is rusted, it should be destroyed, by burning where possible, before the summer rains set in. The rust is easily recognized, and by examining bunches of grass at various places over the field a grower is able to estimate the amount of clean-up work he needs to do. The leaves and stems of the grass, if rusted, will have brownish or black protuberances which are pustules of rust spores.

1/ Presley, John T. *Aecidium gossypii*, the aecial stage of *Puccinia boutelouae*. Phytopath. 32:97-99. Jan. 1942.

When badly rusted the grass is thickly covered by these spots, but by close inspection even light infection is recognizable. Clean cultural practices, including the ditch banks and fence rows, following removal or burning of the dead grass should insure against building up the rust inoculum in the field, and at the same time prove effective in reducing populations of harmful grasshoppers and various hemipterous insects.

There are several fungicides that kill the sporidia of the rust if applied at the right time and in sufficient quantity, but their application would be costly and it would be very difficult to make timely applications. It is only after rains and during periods of high relative humidity that the sporidia are released. A large part of the fungicide that might be applied previous to the rain would be washed off and infection likely would take place before extensive applications of additional dust or spray could be made.
(DIVISION OF COTTON AND OTHER FIBER CROPS AND DISEASES).

RELATIVE PREVALENCE AND GEOGRAPHIC DISTRIBUTION OF VARIOUS EAR ROT FUNGI IN THE 1941 CORN CROP[1/]

P. E. Hoppe[2/]

This is a report of the ninth of a series of annual surveys, begun in 1932, of the relative prevalence and geographic distribution of ear rot fungi in the United States corn crop as indicated by platings of that portion of the crop reaching terminal markets. The results of the previous surveys have been reported annually (PDR 18:186-189, 20:26-30, 20:312-316, 21:222-224, 22:234-241, 23:142-148, 24:210-213, and 25:148-152). These surveys have been made possible through the active cooperation of the Grain and Seed Division, Agricultural Marketing Service, and grain inspectors licensed under the United States Grain Standards Act. Samples containing the sound and the commercially damaged kernel separates from samples of carload lots of corn of known origin are sent to the Chicago office of the Grain and Seed Division, Agricultural Marketing Service, for review, after which they are sent to the writer. The kernels in the damaged separates then are plated to identify the fungi associated with the damaged kernels. The kernels are first surface-sterilized by immersion for 10 to 12 minutes in a 10% solution of the commercial product "B.K." (3.5% sodium hypochlorite) after which they are plated on slightly acidified potato dextrose agar, incubated for 4 days at room temperatures, and then the organisms are identified.

1/ Survey conducted by the Grain and Seed Division, Agricultural Marketing Service, U. S. Department of Agriculture, the Wisconsin Agricultural Experiment Station, and the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, cooperating.

2/ Associate Pathologist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture.

Table 1. Average percentages, by States and regions, of fungi recovered in plating damaged kernels from samples obtained from carload lots of corn arriving at terminal markets (1941 crop).

Origin of samples	No. carloads sampled	Total damaged kernels	Sound kernels	Diplodia 1/	Gibberella zeae	Fusarium moniliforme	Other fusaria	Nigrospora sphaerica	Mucors	Penicillium spp.	Aspergillus spp.	Sterile kernels	Miscellaneous	Unidentified 2/
Atlantic Seaboard States:														
Md.	12	2.8	1.4	29.7	2.0	32.8	-	0.3	7.3	11.8	-	2.8	11.9	-
Southern States:														
Ky.	3	4.5	-	59.2	-	33.3	-	-	3.1	2.0	0.9	0.7	0.8	-
Tenn.	36	4.6	0.8	50.1	0.2	39.5	0.2	-	2.3	0.9	0.7	0.2	4.9	0.2
Ala.	2	5.5	-	49.0	-	36.7	1.1	-	-	-	-	-	8.0	5.2
Miss.	3	5.3	-	63.3	-	27.7	-	-	2.5	-	1.7	2.0	2.8	-
Average:	44	4.7	0.6	51.6-	0.1	38.3	0.2	-	2.3	0.8	0.8	0.3	4.6-	0.4
East-Central States:														
Ohio	10	3.8	0.8	45.6	0.7	7.8	-	0.5	9.4	9.0	-	6.7	19.5	-
Ind.	11	4.6	0.3	49.1	2.2	22.6	0.4	0.2	3.9	12.2	1.2	0.7	7.2	-
Ill.	154	4.6	0.4	69.3	2.8	11.0	0.1	0.1	3.6	4.0	0.9	0.8	6.9	0.1
Average:	175	4.5	0.4	66.7	2.7	11.5	0.1	0.1	4.0	4.8	0.9-	1.1	7.6+	0.1-
West-Central States:														
Minn.	14	5.0	0.7	14.6	9.3	13.0	1.1	2.2	6.1	18.3	0.5	8.6	25.6	-
Iowa	35	3.6	0.3	66.8	4.5	12.6	0.7	0.8	3.0	2.1	0.1	1.6	7.4	0.1
Mo.	15	6.0	2.2	37.1	-	34.4	-	0.3	10.5	1.5	2.1	1.4	10.5	-
Average:	64	4.5	0.8	48.4+	4.4	17.8	0.6+	1.0-	5.5	5.5	0.7	3.1	12.1	0.1-
Western States:														
Nebr.	4	5.0	-	22.9	-	49.0	1.0	-	12.7	5.6	0.7	2.4	5.7	-
Kans.	1	3.1	-	-	-	42.4	-	-	12.1	-	-	24.3	21.2	-
Average:	5	4.6	-	18.4	-	47.7	0.8	-	12.6	4.5-	0.5	6.7	8.8	-
Southwestern Region:														
Texas	32	8.1	3.4	21.4	-	30.5	0.2	-	4.8	1.8	19.9	2.9	15.1	-

1/ *Diplodia zeae* in all regions except Southern States. Here both *D. zeae* and *D. macrospora* occurred and their totals are combined.

2/ A fungus frequently found in eastern samples and occasionally in those from elsewhere. Its pathogenicity as a stalk and ear rot fungus has been demonstrated by the writer in artificial inoculation experiments.

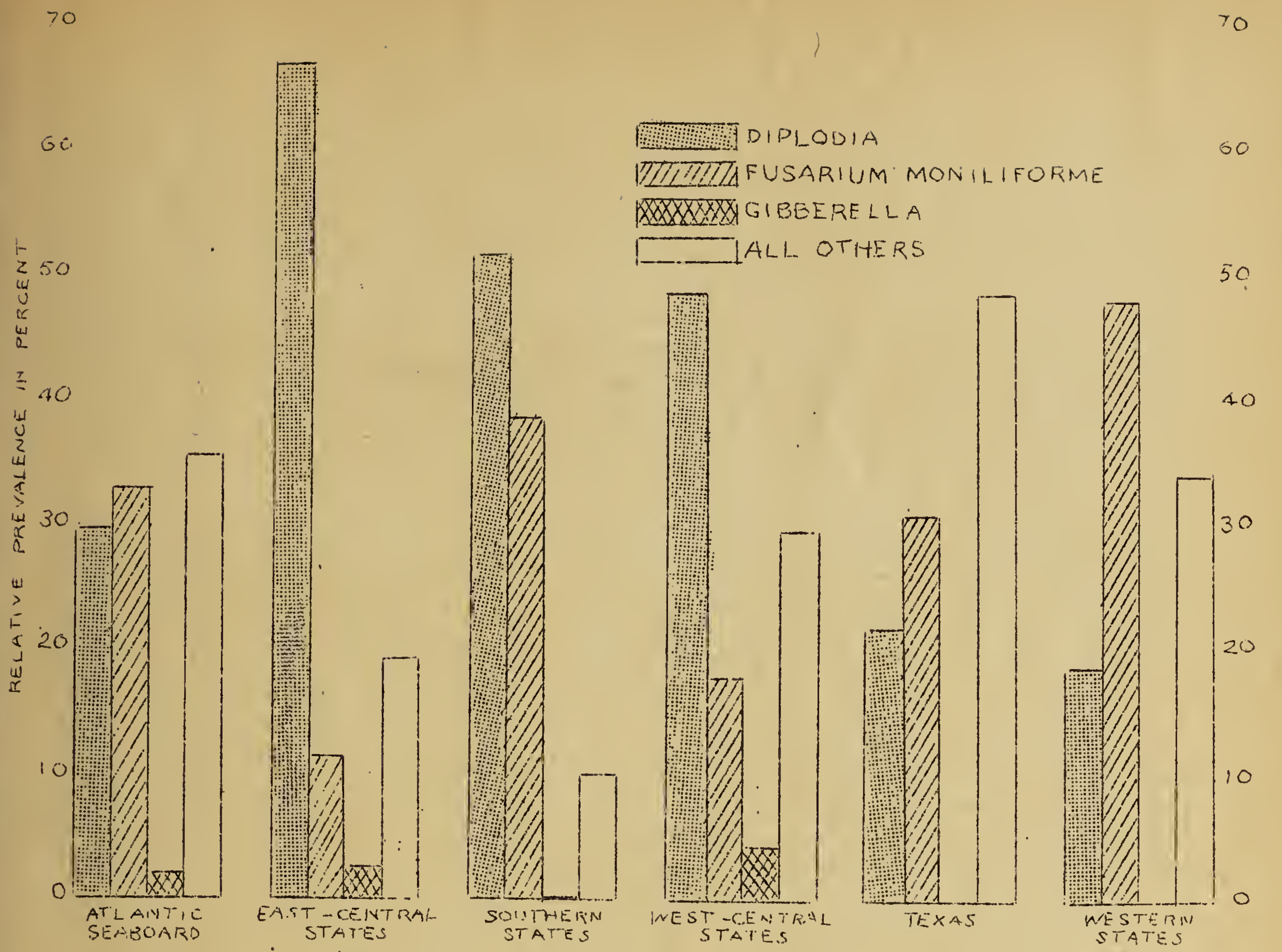

Figure 1. -- Relative prevalence of Diplodia (D. zeae and D. macrospora), Gibberella zeae, Fusarium moniliforme, and a group which includes all other fungi, bacteria, sterile kernels, etc. in the 1941 corn crop for 6 general geographic regions, as indicated by platings of the damaged kernels in samples obtained from carload lots of corn arriving at terminal markets from the regions indicated. (From data in table 1).

Results of 1941 Survey

A total of 332 samples of the 1941 crop were plated. Approximately 300 of these represented November and December shipments and the remainder were from January receipts. Nearly one-half (155) of the samples were from Illinois, a region in which ear rots appear to have been more prevalent in 1941 than in the other Corn Belt States. The results of the 1941 survey are tabulated for States and geographic regions in table 1, and are presented graphically in figure 1. A brief discussion of them follows:

ATLANTIC SEABOARD (Maryland). The results obtained this year differed from those obtained heretofore. The principal differences were an extremely low incidence of Gibberella zeae (only 2%) and a complete absence of an uniden-

tified fungus heretofore always found in Eastern samples. In addition the "total damaged kernels"[3/] in the samples obtained was abnormally low for this region and difficulty was experienced in obtaining a sufficient number of samples. The evidence indicates an unusually low level of ear rots in the field in this area in 1941. A period of drought during late summer and the early fall in this area undoubtedly explains the "abnormal" plating results in 1941 for the Atlantic Seaboard region.

SOUTHERN STATES (Kentucky, Tennessee, Mississippi, and Alabama). Platings from this area ran true to form with Diplodia spp. and Fusarium moniliforme the leading rot fungi. Together they accounted for 90% of the damaged grain. The ratio of D. zeae to D. macrospora in the southern samples was approximately 19 to 1. This agrees with data obtained in the former surveys.

EAST-CENTRAL STATES (Ohio, Indiana, and Illinois). Diplodia was overwhelmingly the leading fungus isolated from the samples originating in this area and accounted for two-thirds of the damaged kernels. F. moniliforme, with 11.5%, was a poor second. As mentioned previously ear rots appear to have been very prevalent in Illinois in 1941. Many samples originating in some of the best corn growing counties in this State ran as high as 6 to 10% "total damaged kernels" and frequently 90% or more plated Diplodia. Evidence such as this indicates that there is room for considerable improvement in some of the corn hybrids in commercial production with respect to resistance to the Diplodia ear rot disease.

WEST-CENTRAL STATES (Minnesota, Iowa, and Missouri). The data in table 1 show different plating results for each of these States. Diplodia and F. moniliforme were about of equal importance in the Missouri samples and together accounted for approximately 70% of the damaged kernels. The Iowa results were much like those from Illinois with Diplodia easily the leading fungus. Diplodia was plated from nearly 70% of the kernels in the Iowa samples. Damage in the Minnesota samples was distributed, largely, in order of importance, between storage rot fungi, Diplodia, F. moniliforme, and Gibberella. The incidence of Gibberella was 9.3%. Evidence that the Gibberella area in 1941 extended into Iowa is shown from a study of the distribution of Gibberella in this State. Five samples were received from counties in northern Iowa and these averaged 17.9% Gibberella as compared with an average of only 3.3% for the remaining 30 samples originating elsewhere in the State.

SOUTHWEST (Texas). With one exception the Texas samples came from a region generally southeast of the central portion of the State, centering around Guadalupe and McLennan Counties. The damage in the Texas samples differed distinctly from that in the Corn Belt samples in that much of it was not caused primarily by fungi but rather by weevils and possibly other insects. Texas samples in the past always have been characterized by high percentages of Aspergillus spp. 1941 was no exception and nearly 20% of the damaged kernels plated Aspergillus. Among the better recognized ear rot fungi Diplodia and F. moniliforme were most prevalent and between them accounted

3/ "Total damaged kernels as defined in the Official Grain Standards for corn are kernels and pieces of kernels of corn which are heat damaged, sprouted, frosted, badly ground damaged, badly weather damaged, or otherwise materially damaged."

for slightly over 50% of the damaged grain. No cultures of *D. macrospora* were observed in the Texas platings.

WESTERN STATES (Kansas and Nebraska). Only 5 samples were obtained from this area in which *F. moniliforme* always has been the predominant ear rot fungus. The 1941 samples averaged 47.7% for *Fusarium* and 18.4% for *Diplodia*. This is somewhat lower for *Fusarium* and slightly higher for *Diplodia* than normally is expected in the Western States.

RICE BLAST IN ARKANSAS

E. M. Cralley and C. R. Adair

Blast or rotten-neck (*Piricularia oryzae* Br. & Cav.) of rice (*Oryza sativa* L.) has been causing serious losses in Arkansas in new areas recently brought into rice production. The disease decreases in importance as the land is cropped to rice, and rarely causes severe injury after 3 or 4 crops have been grown on the land. Minor losses have been observed on old rice fields which previously had been out of rice production for a number of years.

Symptoms have been observed on various parts of the plants including leaves, leaf sheaths, and nodes; however, the most outstanding symptom is the blasted panicle resulting from infection of the neck region. Occasionally, plants growing on levees lodge as a result of infection of the lower nodes. This latter type of injury is sometimes erroneously diagnosed as stem rot (*Leptosphaeria salvinii* Catt.) by rice farmers.

Owing to the importance of rice blast in a number of new rice areas, outlying varietal tests were conducted in 1940 and 1941 to determine whether the common commercial varieties or hybrid selections differ in their reaction to this fungus. The varieties were grown in 3-rod row randomized plots. Four replications were used in 1940 and six in 1941. Notes were taken on the percentage of blasted panicles in the center row of each of the 3-rod row plots when the varieties reached maturity. The results are shown in the accompanying table.

The results show that there is a significant difference in the reaction of several of the varieties to blast. Early Prolific, a variety commonly grown on new land, is very susceptible while Zenith and Arkansas Fortuna, which normally outyield Early Prolific and command better prices, are resistant. The high-yielding hybrid selections, Arkrose and Prelude, appear to be moderately resistant to blast.

Reaction of Rice Varieties to Blast

Variety	Infection: Blackton, Ark. 1940	Newport, Ark. 1940	Brinkley, Ark. 1941
	Mean percentage	Mean percentage	Mean percentage
Rexoro X Delitus, B321A2	0.0	0.0	0.7
Rexoro X C. I. 5094, 3324A1	0.0	0.0	...
Shoemed	0.3	0.0	0.0

Variety	Infection: Blackton, Ark. 1940	Newport, Ark. 1940	Brinkley, Ark. 1941
	Mean percentage	Mean percentage	Mean percentage
Nira	0.3	0.0	1.3
Arkansas Fortuna	0.4	0.4	0.1
Zenith	0.6	0.2	0.0
Asahi	1.3	0.1	1.2
Edith	2.4	3.1	0.5
Lady Wright	2.7	2.1	0.6
Acadia	2.7	0.2	1.6
La. Blue Rose, C2854-3	3.6	0.0	1.1
Colusa	3.9	3.1	...
Kameji X Blue Rose, AH-29-153	4.9	1.7	...
Arkrose	5.2	0.5	2.1
Edith X Caloro, AH-29-3-1	5.7	4.0	...
Prelude	6.0	0.5	1.1
Caloro	8.6	1.5	3.8
Supreme Blue Rose	9.7	0.1	0.8
Old Style Blue Rose	12.9	0.8	3.5
Early Prolific	23.6	9.5	8.9
Imp. Blue Rose X Fortuna, C2920A41	...	...	0.0
Stephen's selection	...	...	0.0
Edith X Fortuna, C283A9	...	...	0.1
Kameji X Blue Rose, B2912A13	...	...	0.5
Kameji X Blue Rose, AH-29-128	...	...	0.9
Kameji X Blue Rose, B2912A47	...	...	0.9
Nakata Shinriki	...	...	2.7
Forest Rose	...	...	10.5
Colusa X Blue Rose, B2913A29	...	...	11.7
Difference required for significance -5%:	2.93	2.42	2.93
1%:	3.91	3.22	3.89

(COOPERATIVE INVESTIGATIONS, ARKANSAS AGRICULTURAL EXPERIMENT STATION AND DIVISION OF CEREAL CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY).

PLANT DISEASES IN MONTANA

PHOMA INFECTION OF SUGAR BEETS PLANTED IN THE FALL. — M. M. Afanasiev.

Sugar beets were planted in the fall of 1940 in the Gallatin Valley near Bozeman, Montana, to determine whether seeds could be raised satisfactorily.

The growth of beet plants in the fall was very good and at the time approaching their dormancy period the roots were 1 to 1-1/2 inches in diame

The winter of 1940-41 was rather mild with only a little snow on the ground. During the early part of the spring of 1941 frequent freezings and thawings occurred with apparently an injurious effect on the sugar beets which were yellowish in color and low in vigor. When the fields were inspected in the latter part of the spring many of the beet roots were entirely or partly rotted. Representative samples were collected to determine the cause of the rot. Isolations were made on potato dextrose agar, and from nearly every beet a pure culture of Phoma betae (Oud.) Fr. was obtained. This organism is at the most a weak parasite, capable of causing root rot only after the normal resistance of the beet has been seriously impaired. These beets were grown under unfavorable climatic conditions, and no doubt their vigor was much reduced as the root rot was responsible for practically a total loss of the crop.

VIOLET ROOT ROT OF POTATOES AND SUGAR BEETS. -- H. E. Morris.

In 1941 one sample of Katahdin potatoes and one sample of sugar beets affected with a disease not heretofore listed in Montana were received by the Botany Department for identification. Both samples came from Cascade County, in the vicinity of Great Falls, Montana.

The disease was identified as violet root rot caused by Rhizoctonia crocorum (Pers.) DC.

The surface of the potato was more or less covered with a felt-like mass of the mycelium which was chocolate color when dry, and violet-brown when moist. The greater part of the mycelium mat could be removed. On the potato skin were present numerous small black dots, which under the microscope had the appearance of sclerotia. The entire surface of the Katahdin tubers were reddish in appearance in contrast to the normal cream-buff color.

No cultures were attempted.

The sugar beets showed the characteristic mycelium on the surface cracks, together with the minute sclerotia. There was also considerable rotting of the beet, apparently due to the fungus. The rot began at or near the crown and progressed downward, turning the attacked tissue brown to almost black in color. The disease was not widespread and in this particular case caused no economic loss.

No information concerning the extent of loss or conditions under which the disease was prevalent was obtained by further inquiry. This disease, although new to the State, is not considered serious at the present time.

SCLEROTINIA ON GREAT NORTHERN BEANS. -- H. E. Morris

A 20-acre field of Great Northern Beans in the Canyon Creek District west of Billings was inspected on account of a serious disease condition.

Many bean plants showed severe injury and an examination revealed many sclerotia in the pith of the stems. These were probably the sclerotia of Sclerotinia libertiana [S. sclerotiorum] which is parasitic on beans. No infection experiments were made. Specimens were submitted to the Bureau of Plant Industry, Washington, D. C. for identification.

It was estimated by the owner that the disease had reduced the yield 80%. Another nearby 10-acre field showed a 50% loss.

The grower stated that the disease had been present for several years and was generally distributed in a restricted area. The disease was more destructive during 1941 than in former years. (BOTANY AND BACTERIOLOGY DEPARTMENT, AGRICULTURAL EXPERIMENT STATION, MONTANA STATE COLLEGE, BOZEMAN).

BRIEF NOTES ON PLANT DISEASES

DEVELOPMENT OF APPLE SCAB IN PENNSYLVANIA: The following is a summary of the examination of apple scab perithecia made this spring in Pennsylvania by G. L. Zundel, A. H. Bauer, C. S. Cannon, and myself. In February one examination of 100 perithecia showed no differentiation. In the first half of March 120 perithecia were examined from 2 collections. These showed no differentiation. Of 304 perithecia examined from 5 collections of leaves, March 16 to 25, 63% were undifferentiated, 29.7% showed asci with no spores, 7% had asci with colorless spores, and 1.3% had asci with some colored spores. All these collections were made from unsprayed or partly sprayed orchards and it appears to us that the scab fungus [Venturia inaequalis] is developing more slowly than usual, because of the extremely dry weather last fall during the latter part of August and September. (R. S. Kirby, Extension Plant Pathologist, March 31.)

MATURATION OF PERITHECIA OF THE APPLE SCAB FUNGUS IN MISSOURI, 1942: Several collections of scabbed Rome Beauty apple leaves were examined at Columbia, Missouri on February 12. Perithecia were found in 67% of the leaves examined but less than 1% contained mature ascospores. A collection of scabbed Red Delicious apple leaves was examined on February 28. Perithecia were numerous and counts showed 23% contained mature ascospores. (M. A. Smith, Division Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry).

A NEW FUNGUS ON BERMUDA GRASS IN LOUISIANA: A clump of Bermuda grass (Cynodon dactylon (L.) Pers.) was found early in February at Baton Rouge, Louisiana, infected with a Phyllachora which was identified as Phyllachora cynodontis Niessl by Dr. C. R Orton at West Virginia University. The stromata of the fungus were found in great numbers on all the leaves of the prostrate culms leading out from one clump. This clump was growing among some trees and shrubbery in a rather protected spot on the campus of the Louisiana State University. Only a single infected plant was found.

According to Dr. Orton, this is the first record of this fungus from continental North America. (George Nyland, Department of Botany, Louisiana State University).

"MEETING THE SPRAY MATERIAL SHORTAGE" is the title of Connecticut Agricultural Experiment Station Bulletin 455 (March 1942), by Neely Turner and James G. Horsfall. Besides accurate diagnosis of diseases and careful selection of crops to be protected, emphasis is on the practicability of

the conservation of materials by reducing the dosage, and on the prevention of waste by improving the efficiency of application, by timing treatments according to weather, and by timing planting of crops to escape pests.

The authors' emphatic statement, regarding the application of dusts when dew is on the plants, "This fact has been known for at least 100 years and it is high time to apply it" (p. 177, authors' italics), is pertinent to many other plant disease situations.

THE USE OF DINITRO-ORTHO-CRESOL AS AN ERADICANT SPRAY FOR FRUIT DISEASES[1]

E. G. Sharvelle

The control of plant diseases by the application of chemical sprays has been based, until comparatively recently, on the assumption that certain chemicals toxic to plant pathogenic fungi serve as protective agents in preventing the development of plant pathogens when applied prior to inoculation. Most of the chemical sprays now in use are of the protective type, must be applied in advance of infection, and must be maintained by repeated applications as a completely protective coating. The inadequacy of such methods, requiring repeated and costly spraying accurately timed to coincide with potential periods of infection, has been apparent for some time.

Cordley[2], in 1908, introduced lime sulfur as a dormant spray for the control of apple scab. Since that time lime sulfur has been widely used in most states for the control of fruit diseases. Lime sulfur in the polysulfide form functions essentially as an eradicant spray for the elimination of primary inoculum before its liberation. Lime sulfur when applied as a spray will form a residue on the plant parts to which it is applied, and the polysulfide sulfur in this deposit will ultimately be converted wholly or in part to elemental sulfur. In this form lime sulfur functions as a protective spray, and has been used as a summer spray for the control of such diseases as apple scab and brown rot of stone fruits. The phytocidal properties of lime necessitate caution in its use, and in some instances it has not proven entirely satisfactory as a summer spray. Keitt and Palmiter[3] advocated the use of "complementary procedures based on the principles of immunization and eradication in addition to protection" in combating fruit diseases. They reported that suitable mixtures of copper, lime, and arsenic have eradicant properties because their fungicidal action is effective at considerable distances from the undissolved residue. Such mixtures were also found to be highly effective for the inactivation of fungal fruiting structures on the surface of invaded tissues. Several pathogenic fungi, including Venturia pyrina, Coccomyces hiemalis,

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1/ Paper No. 1988, Scientific Jour. Series, Minnesota Agricultural Experiment Station.

2/ Cordley, A. B. The lime-sulfur spray as a preventative of apple scab. Rural New Yorker 67:202. 1908.

3/ Keitt, G. W. and Palmiter, D. H. Potentialities of eradicant fungicides for combating apple scab and several other plant diseases. Jour. Agr. Res. 55 (6). 397-438. 1937.

Dibotryon morbosum, Mycosphaerella rubina, and Sclerotinia [Monilinia] fructicola, were inactivated by eradicant fungicides composed of appropriate mixtures of copper sulfate, milk of lime, calcium arsenite, and zinc arsenite.

In 1939 a coordinated project was undertaken by workers at several experiment stations to investigate the value of the sodium salt of dinitro-ortho-cresylate (Elgetol) as an eradicant spray for the control of apple scab. The results obtained in Minnesota are recorded in this paper.

Methods

Apple scab control. In the spring of 1940 an isolated ten-acre block of McIntosh apples was selected from an orchard of 126 acres for "ground spray" experiments with dinitro cresol. The rows selected for the treatment were located at the northern edge of the orchard to reduce the likelihood of infection by wind-blown spores from other sources; there were no orchards for several miles northward from the experimental block. The orchard rows which were not sprayed with dinitro cresol were situated immediately to the south of the above rows. A ground spray of 0.5% Elgetol was applied on April 30, 1940, to the experimental block, at the rate of 500 gallons to the acre, using a 350-gallon Friend sprayer with 2 lines of hose. Care was taken to spray the ground immediately beneath the trees very thoroughly by applying the eradicant material from both sides of the tree, along the rows and across the orchard. The entire orchard later was sprayed 5 times with lime-sulfur, the first application being made on May 9, and the last August 9.

In 1941 the same orchard was used for the experiment, the same ground area being sprayed with Elgetol as in the previous season but the summer spray used was Stauffer Magnetic "70" sulfur paste instead of lime sulfur, 5 applications being made as in the previous season. In 1941 a 7-acre block of the variety Cortland, just coming into full bearing, which had not been thoroughly sprayed during previous seasons, was also used for Elgetol experiments. Part of this orchard was treated with 0.5% Elgetol, and all of it was then sprayed during the summer with Stauffer Magnetic "70" sulfur paste, using a schedule identical with that employed for the McIntosh block on the same property. All were kept under observation during the summers, but scab developed on the foliage too late in both seasons to permit the recording of accurate data on foliage infection. At harvest time, which occurred on September 24 in 1940, and on September 11 in 1941, samples of apples were taken from trees at random throughout the experimental plots. The samples from each plot were then graded (by hand) for scab infection, the percentage of fruit infected and the severity of scab being recorded. Each scab-infected fruit was given an arbitrary disease rating similar to that used in cereal rust studies. A rating of "0" indicated no scab infection, a rating of "1" being given to fruit with 1-2 scab lesions, "2" for fruit with 3-5 scab spots, "3" for 6-9 lesions, and a rating of "4" for fruit with 10 or more scab lesions. The averages of these disease ratings were used as the criterion for scab severity in each plot.

Results

The results are given in Table 1. During 1940 a striking reduction in the amount of scabby fruit resulted when 0.5% Elgetol was used as a ground spray in addition to the regular lime sulfur schedule. In addition to a reduction of 16% in the amount of scabby fruit, the severity of infection also was noticeably decreased. The arbitrary disease rating of 1.21 for the fruit from the block receiving the Elgetol treatment indicates that each infected fruit had an average of less than 2 scab lesions. On

Table 1. Effect of ground sprays of 0.5% Elgetol on the development of apple scab.

Year	Variety	Treatment	Total No. apples examined	Total No. scab-infected apples	Percentage scab	Average disease rating
1940	McIntosh	Reg. Schedule	1000	205	20.5	2.44
	McIntosh	Reg. Schedule plus Elgetol	1000	41	4.1	1.21
1941	McIntosh	Reg. Schedule	580	35	6.0	1.80
	McIntosh	Reg. Schedule plus Elgetol	510	21	4.1	1.90
	Cortland	Reg. Schedule	393	218	56.6	1.85
	Cortland	Reg. Schedule plus Elgetol	194	54	27.6	1.51

the other hand, the disease rating of 2.44 for infected fruit from the plot that did not receive Elgetol indicates that each infected fruit had an average of more than 5 lesions. If a cull apple, from the standpoint of scab, were to be defined as any fruit having 5 or more scab lesions, of the 20.5% infected apples from the plot not receiving Elgetol, 9.9% could be designated as culls. Of the 4.1% infected fruit from the plot receiving the ground spray only 0.5% could be designated as culls. This reduction in severity of scab infection would result in a large increase in the amount of marketable fruit.

In 1941 the use of Elgetol on the same trees as those in the experiment of the previous year did not result in a marked decrease in scab infection when compared with trees not receiving the treatment. However, the percentage of scabby fruit in both sections of the plot was considerably reduced when compared with the previous season. This cannot be explained on the basis of a light scab year, as the variety Cortland in other orchards in the same region was heavily infected in 1941. Neither can it be attributed to the increased efficiency of Stauffer Magnetic "70" sulfur paste as a protective spray, for Cortland apples sprayed with this material were severely infected in 1941. It would appear from these results that Elgetol has a carry-over effect from the previous season's application.

In the Cortland orchard, which was heavily infected with scab, ground spraying with Elgetol again greatly reduced the percentage of scabby fruit, and also slightly reduced the severity of the disease.

Control of Raspberry Anthracnose

Anthracnose (*Elsinoë veneta*) of red raspberries has become a problem of sufficient importance in Minnesota during recent years to justify investigations on methods of control. In the course of routine experiments on its control in 1940, 0.5% Elgetol was used as a delayed dormant spray. The results are given in table 2. The delayed dormant applications were applied to the canes during the "green tip stage", just as the buds were beginning to burst, and the cover sprays were applied one month later when the leaves were fully expanded. At harvest time each hill in the various plots was inspected individually, being considered as infected if any of the canes within the hill were diseased. The severity of the disease within each hill was designated by an arbitrary disease

Table 2. Control of raspberry anthracnose.

Location	Treatment	Time of application	Av. length of canes (ins.)1/	Percentage hills infected1/	Average infection type1/
Duluth First Location	Unsprayed	----	42.2	99.7	2.8
	1/2% Elgetol	Delayed dormant	39.2	80.6	1.1
	1/2% Elgetol 4-4-50 Bordo	Delayed dormant Cover spray	39.9	77.7	1.3
	1/2% Elgetol Copper Compound "A"	Delayed dormant Cover spray	43.8	88.8	1.8
	3-50 lime sulfur 4-4-50 Bordo	Delayed dormant Cover spray	42.7	30.5	0.4
Duluth Northeast experiment station	Unsprayed	-----	----	98.8	2.6
	1/2% Elgetol	Delayed dormant	----	46.6	0.9
	3-50 lime sulfur Copper Compound "A"	Delayed dormant Cover spray	----	21.4	0.4
	3-50 lime sulfur 4-4-50 Bordo	Delayed dormant Cover spray	----	12.2	0.2

1/ Results represent the average of 50 observations on separate hills within the individual spray plots.

rating similar to that described for the apple scab work. At the first location a single application of 0.5% Elgetol reduced the percentage of infected hills to some extent, and greatly reduced the severity of the disease. The addition of a cover spray of 4-4-50 bordeaux mixture further increased the degree of control, but neither of these treatments were as efficient as a delayed dormant application of 3-50 liquid lime sulfur followed by a cover spray of 4-4-50 bordeaux mixture. At the second location slightly better control was obtained with a delayed dormant application of Elgetol, the percentage of infection being reduced to less than half that of the unsprayed plot. The severity of infection was again greatly reduced by this treatment. The lime sulfur-bordeaux combination again proved to be the most effective method of control. The results obtained in 1940 indicated that Elgetol used as a delayed dormant spray may have some value as a control for raspberry anthracnose. In 1941 the experiment was repeated using Elgetol at a strength of 0.75%, again applied as a delayed dormant spray. Detailed records were not kept of these experiments but observations indicated that Elgetol applied as a delayed dormant spray at this strength was equally as effective in controlling raspberry anthracnose as 3-50 liquid lime sulfur. Certain growers in Minnesota are considering Elgetol as a substitute for lime sulfur in their commercial spray program, as it would be somewhat cheaper and appears to cover more surface than equivalent amounts of lime sulfur, thereby requiring less material for the delayed dormant spray application. The use of Elgetol at a strength of 1% might be worthy of consideration as a dormant spray for the control of this disease.

(MINNESOTA AGRICULTURAL EXPERIMENT STATION, UNIVERSITY FARM, ST. PAUL, MINNESOTA).

* Acknowledgment is made to the Standard Agricultural Chemicals Company, Hoboken, New Jersey, for supplying Elgetol for the above experiments.

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IN THIS ISSUE

SUMMER MEETING
AMERICAN PHYTOPATHOLOGICAL SOCIETY

The Summer Meeting of the American Phytopathological Society will be held June 25-26, 1942, in the Secor Hotel, Toledo, Ohio. The first session will begin at 10:00 a.m. June 25.

The purpose of this meeting is to assist in coordinating the various war emergency efforts of the Society. The functions, accomplishments and future plans of the Society's War Emergency Committee, sub-committees, and sectional committees will be reported briefly with plenty of opportunity for discussion. Topics to be discussed, if time permits, include: fungicides - their availability and substitutes, coordinated research programs, duties of extension pathologists, draft deferment, disease surveys, quarantines, seed treatment and certification, cooperation with workers in other sciences, and other timely subjects.
(COMMITTEE ON PROGRAM AND ARRANGEMENTS, 1942 SUMMER MEETING).

SPERGON (CHLORANIL) AND SCURF CONTROL OF SWEET POTATOES

Robert H. Daines

In the Plant Disease Reporter, Volume 26, Number 11, O. H. Elmer presented his results on the use of Spergon as a sprout treatment for the control of stem rot of sweet potatoes, as a suggestion to others investigating the control of field diseases of the sweet potato. Such a suggestion seems most valuable in the present emergency when substitutes for mercury may soon be urgently needed. In this same spirit the writer presents his 1941 experimental results, using Spergon as a sprout treatment for the control of scurf [Monilochaetes infuscans] of sweet potatoes.

In an exploratory experiment, conducted at New Brunswick, New Jersey sprouts produced by badly scurfed untreated potatoes were treated in various dipping materials and then planted. At the time of setting, the soil and air were dry and hot and in spite of the fact that the plants were watered when set, severe wilting occurred. Under these conditions the sprouts treated with Semesan Bel (1-10) showed rather severe burning of the underground portions of the plants and their growth was consequently retarded. Such stem and root burning did not occur on the untreated plants or on those treated with Spergon.

At harvest time the potatoes and the first 6 inches of the underground portion of the stem were examined for scurf. The data secured from these counts are presented in the accompanying table. While Spergon was not so effective as the mercurial in scurf control, it did give partial control. Perhaps, in the case of necessity, fairly good results could be obtained if the grower selected apparently scurf-free potatoes for bedding and then, as a precaution treated the sprouts in Spergon.

The fact that fewer sweet potatoes were examined in the Spergon treatments than in the other blocks (accompanying table) does not indicate a reduction in yields for the Spergon treatments.

Results of sprout treatments for scurf control

Materials	Underground portion of stem: Examined	Underground portion of stem: Free from scurf	Underground portion of stem: Scurf	Fleshy roots: Sweet potatoes examined	Fleshy roots: Free from scurf	Fleshy roots: Slight scurf	Fleshy roots: Severe scurf
	No.	%	%	No.	%	%	%
Semesan Bel 1-10	100	68	32	358	97.3	1.4	1.3
Spergon (wettable) 1 lb. to 5 qts. water	100	42	58	261	87.4	5.0	7.6
Spergon (wettable) 1 lb. to 10 qts. water	100	28	72	250	66.8	17.2	16.0
Check, Untreated	100	7	93	437	64.3	20.1	15.6

(NEW JERSEY AGRICULTURAL EXPERIMENT STATION).

NOTES ON APPLE SCAB IN NEW YORK

Western New York: In a McIntosh leaf sample gathered at Ithaca the morning of April 3, less than half the ascospores in 28% and over half in 30% of the perithecia examined were colored. Very slight spore discharge occurred from leaves in a moist chamber over trap slides for 4 hours.

Asci were well developed in 32% of the perithecia and 2 or 3 days over 50° F. would increase the numbers of colored spores in damp leaves. (W. D. Mills, New York State College of Agriculture).

Hudson Valley: Apple trees are still dormant in the Hudson Valley but the present mild weather will soon push them into a silver tip stage. Owing to the dry season last year the commercial orchards have a very light carry-over of scab [*Venturia inaequalis*].

McIntosh leaves collected from Red Hook, Dutchess County, March 27 were found with 15% of the perithecia in the pre-ascus stage, 50% in an early-ascus stage, 30% with uncolored spores, and 5% with a few of the spores colored.

McIntosh leaves collected from the Clintondale section of Ulster County April 3 showed 27% of the perithecia in the pre-ascus stage, 58% in the early-ascus stage, and 15% with uncolored spores. (D. H. Palmiter).

FURTHER EVIDENCE OF THE FUNGICIDAL VALUE OF SPERGON

Roger H. Davy

O. H. Elmer[1] and R. W. Leukel[2] have recently reported in the Plant Disease Reporter on the merits of Spergon in the treatment of sweet potato seed and sprouts, and for the control of covered smut in sorghum. The following is submitted as further evidence of the value of this non-metallic dust as a seed protectant against damping-off and seed rotting organisms.

That chemical dusts will temporarily protect certain seeds from soil-inhabiting fungi is now an almost universally accepted principle. Experimental data confirming the value of seed treatment on a number of field legumes have been presented by Chilton and Garber[3] while McNew[4] in New York, and Sharvelle and Shema[5] in Minnesota have shown Spergon to be effective in increasing the stand and yield of canning peas.

During the fall of 1941 and early in 1942, greenhouse trials were conducted at Stillwater, Oklahoma, testing the efficacy of seed treatment on Virginia soybeans (Soja max) and hairy vetch (Vicia villosa). Chemicals used in the tests were New Improved Ceresan (5% ethyl mercury phosphate), Spergon (tetrachloroquinone), and Spergonex (composition unknown to writer). Dusting rates for both species were 1/2 ounce per bushel for the mercury compound, and 2 ounces per bushel for the two latter materials. Non-treated seeds served as controls. Replicated plantings were made in greenhouse flats containing soil naturally infested with Rhizoctonia solani Kühn, held at an average daily mean temperature of 60° F. A high level of soil moisture was maintained, a condition which proved to be favorable for attack by Rhizoctonia.

With the two species tested, both Spergon and New Improved Ceresan were effective in the prevention of seed rots and pre-emergence damping off as is shown by the following table:

Species tested	Means of emergence counts for the treatments a/			
	Spergon	Spergonex	New Improved Ceresan	Non-treated
Soybeans	117.5	80.	99.	59.
Vetch	170.	149.	160.	145.

a/ Each treatment consisted of 200 seeds per replication.

1/ Elmer, O. H. The use of Spergon for sweet potato seed and sprout treatments. Plant Dis. Reporter 26: 44-46. 1942.

2/ Leukel, R. W. Spergon as a seed disinfectant. Plant Dis. Reporter 26: 93-94. 1942.

3/ Chilton, S.J.P., and R.J. Garber. Effect of seed treatment on stands of some forage legumes. Jour. Amer. Soc. Agron. 33: 75-83. 1941.

4/ McNew, Geo. L. Effect of seed treatment on the stand and yield of peas. The Canner. January 11 and 18, 1941.

5/ Sharvelle, E. G., and B.F. Shema. A preliminary investigation of a new seed protectant for canning peas in Minnesota. Abst. in Phytopath. 31: [illegible] 1941.

Statistical analysis of the emergence counts with soybeans showed Spergon highly significant over Spergonex (1% point) and non-treated seed (1% point). Cerosan was significantly better than Spergonex (5% point) and non-treated seed (1% point). Spergonex was significantly better than non-treated seed (5% point). Differences between the Cerosan and Spergon treatments were not significant.

With vetch, the only statistically significant difference was that of Spergon over Spergonex and non-treated seed (both at the 5% point). Although distinct stunting and root necrosis from Rhizoctonia was evident on the vetch seedlings, it is interesting to note that of the 2500 seedlings that emerged, there was no observation of the "toppling over" which so often characterizes Rhizoctonia damping-off of other legumes.
(OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER, OKLAHOMA).

CHECK LIST REVISION

Freeman Weiss

RANDIA (RUBIACEAE).

RANDIA MITIS L., INKBERRY. Shrub or small tree of West Indies, fruit used for dye.

Aecidium abscedens Arth., rust (O,I). P.R.
A. pulverulentum Arth., rust O,I. Canal Zone. On R. spinosa.
Elsinoë sp., scab. P.R.
Meliola psychotriae Earle, black mildew. P.R.
Trabutia randiae (Rehm) Theiss. & Syd., tar spot. P.R.

RAPHIOLEPIS (ROSACEAE)

RAPHIOLEPIS INDICA Lindl., INDIA-HAWTHORN. Evergreen shrub of China cult. for ornament in Calif. and Fla.

Sclerotium rolfsii Sacc., southern blight. Fla.

RAUWOLFIA (APOCYNACEAE).

RAUWOLFIA TETRAPHYLLA L., small flowering tree of the West Indies.

Meliola tabernaemontanae Speg., black mildew. P.R.

RHABDADENIA (APOCYNACEAE)

RHABDADENIA CORRALICOLA Small. and R. PALUDOSA (Vahl) Miers. Woody vines or shrubs of S. Fla. and West Indies.

Cephaleuros virescens Kze., green scurf. Fla.

RHABDADENIA CORRALICOLA -- continued.

Cercospora sp., on leaves. Fla.
Irene sororcula (Speg.) F.L. Stevens, black mildew. Canal Zone.

RHAMNUS (RHAMNACEAE)

RHAMNUS ALNIFOLIA L'Herit., ALDER-LEAVED BUCKTHORN, shrub of Growth Regions 4, 12, 18, 21, 22, 23, 24, 26, 27; also R. LANCEOLATA Pursh, LANCE-LEAVED BUCKTHORN, shrub of G.R.'s 22, 25, 27, 29, and R. SMITHII Greene of G.R.'s 11, 13, 1

Cercospora rhamni Fckl., leaf spot. Wis.
C. aeruginosa Cke., leaf spot. Mo., Nebr., S.Car.
Diaporthe berlesiana Sacc. & Roum. (? D. syngenesiae (Fr.) Fckl.), o branches. Nebr.
Lophiostoma triseptatum Pk., Nebr.
Microsphaera alni DC. ex Wint., powdery mildew. Wis.
Polyporus subspadiceus Fr. Mo.
Puccinia coronata Cda. var. calamagrostis Fraser & Ledingham, crown rust (0,I). N.H. to Ind., Mo. and Wash. II and III on Calamagrostis canadensis and other grasses.
P.c. festucae Erikss., Colo. (On R. smithii).
Sphaerographium niveum Dearn. & House, on branches. N.Y.

RHAMNUS CALIFORNICA Esch., CALIFORNIA BUCKTHORN (coffee-berry), evergreen shrub of Growth Regions 1, 3, 4, 5, 10; also R. CROCEA Nutt., and var. ILICIFOLIA (Nutt.) Greene, HOLLY-LEAF BUCKTHORN (red berry), of G.R.'s 3, 5, 11. Both are cult. for ornament in Zone VII.

Capnodium sp., sooty mold. Calif.
Ceuthospora foliicola (Lib.) Cke., on leaves. Calif.
Diplodia frangulae Fckl., on twigs. Calif.
Ovularia rhamnigena Ell. & Ev., on leaves. Oregon.
Phoma communis Rob. and P. rhamnicola Cke. & Harkn., on twigs. Calif
Pleospora frangulae Fckl., on leaves. Calif.
Puccinia mesnieriana Thüm., rust (III). Calif.
Tympanis frangulae Fr., on branches. Calif.
Septoria rhamni-catharticae Ces., on leaves. Calif.

RHAMNUS CAROLINIANA Walt., YELLOW BUCKTHORN (Indian cherry), shrub or small tree of Growth Regions 17, 20, 22, 25, 28, 29, 30; grown for ornament Zone V.

Cercospora rhamni Fckl., leaf spot. La., Nebr., Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ga.
Puccinia coronata Cda., rust (0,I). Ind., Tenn. (Experimental suscept of oat race.)

RHAMNUS CATHARTICA L., COMMON BUCKTHORN. Shrub of Europe and W. Asia, long cult. for hedges, Zone II; naturalized in the N.E. and Central States.

Cercospora rhamni Fckl., leaf spot. N.J., Wis.
Puccinia coronata Cda., crown rust (O,I). Me. to Pa., Mo. & Mont. II and III on oats and, in the broad sense of the sp., on many native grasses. By some authorities the rust on R. cathartica is limited to the oat race, P. c. var. avenae Fraser & Ledingham (P.c. avenae Erikss. in part); by others the Calamagrostis race, P.c. calamagrostis F. & L. (P. c. calamagrostis Erikss. in part) is included.

RHAMNUS PURSHIANA DC., CASCARA BUCKTHORN, shrub or small tree of Growth Regions 1, 2, 3, 4, 6, 7, 9, 11, 12; cult. Zone VI, for medicinal use.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Wash.
Cylindrosporium rhamni Ell. & Ev., leaf spot. Idaho.
Daedalea unicolor Bull. ex Fr., heart rot. Wash.
Dermatea frangulae (Pers. ex Fr.) Tul., on branches. Calif., Idaho.
Fomes igniarius (L. ex Fr.) Kickx, white heart rot. Idaho.
Marssonina rhamni (Ell. & Ev.) P. Magn., leaf spot. Wash.
Phyllosticta rhamnigena Sacc., leaf spot. Wash.
Puccinia coronata Cda., crown rust (O,I). Mich., Mont. to Oregon & Wash. (Not identified as to race but probably one of the grass races.)
Septoria blasdalei Sacc. & Syd., leaf spot. Calif., Idaho, Oregon, Tex.

RHIZOPHORA (RHIZOPHORACEAE)

RHIZOPHORA MANGLE L., AMERICAN MANGROVE. Small tree of coastal shoals, S. Fla. and West Indies.

Anthostomella rhizomorphae (Kze.) Berl. & Vogl., on leaves. P.R.

RHODODENDRON (ERICACEAE)

RHODODENDRON Spp. (1), AZALEA (horticultural). Many varieties of flowering shrubs derived chiefly from introduced species, varieties and hybrids, as: INDIAN AZALEAS (R. INDICUM (L.) Sweet, R. MUCRONATUM G. Don, R. PULCHRUM Sweet, and R. SIMSII Planch.); KURUME AZALEAS (R. OBTUSUM (Lindl. Planch.); SANDER AZALEAS (R. OBTUSUM X SIMSII); TORCH AZALEA (R. OBTUSUM var. KAEMPFERI (Planch.) Wils.); evergreen or semi-evergreen shrubs of E. Asia, cult. for ornament under glass and in the open, Zones VII to IV. Also GHENT AZALEAS (R. GANDAVENSE (K. Koch) Rehd., a complex hybrid group of European origin) and MOLLIS AZALEAS (R. JAPONICUM (Gray) Swingar and R. MOLLE (Bl.) G.Don together with various hybrids); deciduous shrubs of Europe and Asia, cult. for

RHODODENDRON spp. -- continued
ornament, Zone V. for native azaleas and rhododendrons see individually listed spp.

Alternaria sp., spotting of flowers following abrasion or environmental injury. S. Car.
Botrytis cinerea Pers., flower blight (usually following environmental injuries), seedling blight. Cosmopolitan.
Cercosporina rhododendri (Ferr.) Sacc., leaf spot. Md.
Corticium stevensii Burt, thread blight. La.
Cladosporium sp., spotting of flowers following abrasion. S.Car.
Cuscuta sp., dodder. S.Car.
Erysiphe polygoni DC., powdery mildew. N.J.
Exobasidium burtii Zeller, yellow leaf spot. N.J. On R. luteum.
E. vaccinii (Fckl.) Wor., leaf gall, shoot hypertrophy. Widespread.
Glomerella cingulata (Ston.) Spauld. & Schrenk, spotting of flowers following abrasion. S.Car.
Microsphaera alni DC. ex Wint., powdery mildew. N.J., N.Y.
Ovulinia azaleae Weiss, flower spot. N.Car. to Fla. & Texas; Calif.
Pestalotia sp., spotting of flowers and foliage following abrasion or environmental injury. Southern States.
P. macrotricha Kleb., leaf spot, twig blight. N.J.
P. rhododendri (D.Sacc.) Guba, on leaves. N.Y.
Phoma sp., on twigs.
Phomopsis sp., on twigs. Mass.
P. ericaceana Fairman, on twigs. N.Y.
Phyllosticta maximi Ell. & Ev., leaf spot. Said to be the conidial stage of Venturia rhododendri.
Physalospora obtusa (Schw.) Cke., on leaves. Miss.
Pucciniastrum myrtilli (Schum.) Arth., rust (II,III). N.J. On R. luteum Sweet.
Ramularia angustata Pk., leaf spot. Miss.
Rhizoctonia solani Kühn, damping off. Cosmopolitan.
Septobasidium sp., felt patch. S.Car.
Septoria azaleae Vogl., leaf scorch. Miss., N.J.
Venturia rhododendri Tengwall (Phyllosticta maxima Ell. & Ev.), leaf spot. La.

RHODODENDRON spp. (2), RHODODENDRON (horticultural). Evergreen flowering shrubs, in the U.S. chiefly forms of R. CATAWBIENSE Michx., CATAWBA RHODODENDRON, of Growth Regions 27 & 28, and hybrids of it with the native R. MAXIMUM, and also various European and Asiatic spp. as R. ARBOREUM Smith, R. CAUCASICUM Pall. and R. PONTICUM L.; cult. for ornament, Zone IV. R. CATAWBIENSE as a native sp. is included but R. MAXIMUM is listed separately.

Armillaria mellea Vahl ex Fr., root rot. N.J., N.Y., Wash.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., dieback. N.J.
Botrytis sp. and B. cinerea Pers., flower & twig blight, seedling blight. N.J., Wash.

RHODODENDRON spp. (2) -- continued.

Briosia azaleae (Pk.) Dearn., bud & twig blight. Mass. to N.Car. & Texas, Pacific Coast States.
Cercospora sp. and C. rhododendri March. & Verpl. (= C. handelii Bubak?), leaf spot. N.Y. to Fla.; Calif., Oregon.
Chrysomyxa roanensis Arth., rust (II,III) on R. catawbiense. Tenn. O & I on Picea rubra.
Coccomyces coronatus(Schum. ex Fr.) DeNot., on leaves & twigs, ? twig blight. Va. to Ga.; Oregon, Wash.
C. quadratus (Kze. & Schm. ex Fr.) Karst., on leaves. N.Car., Va.
Coryneum rhododendri Schw., leaf spot. N.Car., Tenn., Va., Wash.
C. r. var. fusoideum Dearn., leaf spot. Tenn.
Cryptostictis mariae (Clint.) Sacc., leaf spot. Tenn., Pacific Coast States.
Cytospora sp., on twigs. N.J.
Diaporthe rhododendri Feltg. (=D. eres Nits.), on branches. N.Car.
Diplodina eurhododendri Voss, leaf spot. Calif.
Discosia artocreas Tode ex Fr., leaf spot. Md.
Exobasidium burtii Zeller, yellow leaf spot. N.J. Especially on R. ponticum but occurs on other spp. & hybrids.
E. vaccinii (Fckl.) Wor., leaf gall, shoot hypertrophy. Widespread.
E. vaccinii-uliginosii Boud., white-leaf,witches'-broom. N.J.
Fumago vagans Pers., sooty mold. Cosmopolitan.
Gloeosporium sp., canker. N.Y.
G. rhododendri Briosi & Cav., leaf spot. Md.
Hendersonia concentrica Ell. & Ev., leaf spot. N.Car., Texas.
Lophodermium melaleucum (Fr.) DeNot., leaf spot. N.Car., Tenn.
L. rhododendri (Schw.) Ell. & Ev., leaf spot. N.Y. to N.Car. & Texas; Pacific Coast States. L. rhododendri Ces. of Europe has priority but the identity of American specimens with it has been questioned; occurs on native spp. but not on hybrid vars.
Melasmia rhododendri Sacc., tar spot. Alaska. On R. camtschaticum Pall.
Microsphaera alni DC. ex Wint., powdery mildew. Md., N.J., N.Y.
Monochaetia sp., leaf spot. N.Y.,Tenn., Wash.
Mycosphaerella clintoniana House (M. rhododendri (Cke.) Siemaszko), leaf spot. N.J., N.Y., N.Car., Oregon, Wash.
Ovulinia azaleae Weiss, flower spot. S.Car.
Pestalotia (Pestalozzia) macrotricha Kleb., "gray blight" of leaves & twigs following winter injury. Widespread.
P. rhododendri (D.Sacc.) Guba.,on leaves. N.J.
P. vaccinii (Shear) Guba. Del., Ind., N.Car.
Phomopsis sp., leaf spot, twig canker. Conn., N.J., N.Y., Pa.
P. ericaceana Fairm., on leaves. Calif. R. californicum?
Phyllosticta maxima Ell. & Ev. (= P. rhododendri Westend.?), on leaves. Widespread. (Said to be the conidial stage of Venturia rhododendri).
P. saccardoi Thüm., leaf spot. N.J., N.Y., W.Va.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

RHODODENDRON spp. (2) -- continued.

Physalospora obtusa (Schw.) Cke., on branches. Ohio.
Phytophthora cactorum (Leb. & Cohn) Schroet., dieback, canker. Mass. to N.J. & Ohio.
P. cinnamomi Rands, wilt. N.J., N.Y., Pa.
P. cryptogea Pethyb. & Laf., root rot, collar rot. N.J.
Pucciniastrum myrtilli (Schum.) Arth., rust (II). On R. lutescens Franch., Conn.; on R. ponticum L., N.J., R.I.
Rhizoctonia solani Kühn, damping off. Conn., N.J.
Septoria rhododendri Cke., leaf spot. Me., Mass., Texas.
Sphaeropsis sp. (sometimes reported as Macrophoma sp.), on leaves. N.J., N.Y.
(Sporocybe azaleae Pk.): Briosia azaleae.

RHODODENDRON ALBIFLORUM Hook., WHITE-FLOWERED AZALEA. Deciduous flowering shrub of Growth Regions 4 & 12, sometimes cult. Zone V.

Exobasidium burtii Zeller, yellow leaf spot. Oregon, Wash.
E. vaccinii (Fckl.) Wor., leaf gall. Idaho.
Melasmia menziesiae Dearn. & Barth. (? M. rhododendri Sacc.), tar spot. Wash.

RHODODENDRON ARBORESCENS (Pursh) Torr., SWEET AZALEA, of Growth Region 27; R. VISCOSUM (L.) Torr., SWAMP AZALEA, of G.R.'s 25, 2 27, 28, 29, 30; and R. PRUNIFOLIUM (Small) Millais, of G.R. 29.

Briosia azaleae (Pk.) Dearn., bud & twig blight. Mass.
Colletotrichum azaleae Ell. & Ev., on leaves. Fla.
Exobasidium burtii Zeller, yellow leaf spot. N.J.
E. vaccinii (Fckl.) Wor., leaf gall. Widespread.
Glomerella cingulata (Ston.) Spauld. & Schrenk., dieback. Md.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Pucciniastrum myrtilli (Schum.) Arth., rust (II,III), Mass. to Ala. On R. viscosum; O and I on Tsuga canadensis.
Synchytrium vaccinii Thomas, leaf gall. N.J.
Valsa delicatula Cke. & Ell., on twigs. N.J.

RHODODENDRON CALENDULACEUM (Michx.) Torr., FLAME AZALEA, of Growth Regions 27 & 28; cult. Zone V.

Exobasidium azaleae (Fckl.) Wor., leaf gall. Widespread.
Microsphaera alni DC. ex Wint., powdery mildew. Ga.

RHODODENDRON CANADENSE (L.) Torr., RHODORA, of Growth Regions 26 & 27, cult. Zone II; and R. VASEYI Gray, PINKSHELL AZALEA, of G.R. 27.

Briosia azaleae (Pk.) Dearn., bud & twig blight. N.Car.
Exobasidium vaccinii (Fckl.) Wor., leaf gall. Me., N.H.

RHODODENDRON CANADENSE -- continued.

Pucciniastrum myrtilli (Schm.) Arth., rust (II,III). Me., N.H.

RHODODENDRON CAROLINIANUM Rehd., CAROLINA RHODODENDRON, evergreen shrub of Growth Region 27; cult. for ornament Zone V; and R. MINUS Michx., PIEDMONT RHODODENDRON of G.R.'s 28 & 29.

Chrysomyxa roanensis Arth., rust (II,III) on R. minus. N.Car., Tenn.
Exobasidium vaccinii (Fckl.) Wor., leaf gall. Tenn.
Gloeosporium ferrugineum Dearn., leaf spot. N.Car.
Laestadia rhodorae Berl. & Vogl., on leaves. Conn.
Leptothyrium parvulum Dearn., on leaves. N.Car.
Mycosphaerella sp., leaf spot. N.Car.
Pestalotia sp. and P. macrotricha Kleb., leaf spot. N.J.,N.Y.,N.Car., Tenn.
Phomopsis sp., leaf spot, twig canker. N.J.
Phyllosticta maxima Ell. & Ev., leaf spot. Conn.
P. saccardoi Thüm., N.Y., N.Car.
Phytophthora cinnamomi Rands, wilt. Md., N.Y.
P. cryptogea Pethyb. & Laf., root & collar rot. N.J.
Rhizoctonia solani Kühn, collar rot. N.J., Tenn.

RHODODENDRON MACROPHYLLUM G. Don (R. californicum Hook.), COAST RHODODENDRON, evergreen shrub of Growth Regions 1 & 2, cult. Zone VI.

Briosia azaleae (Pk.) Sacc., bud & twig blight. Calif., Oregon, Wash.
Cenangella rhododendri (Ces.) Rehm, on inflorescences. Oregon.
Chrysomyxa piperiana (Arth.) Sacc. & Trott., rust (II,III). Calif., Oregon, Wash. O & I on Picea sitchensis.
Coccomyces coronatus (Schum. ex Fr.) DeNot., on leaves & stems, ? twig blight. Pacific Coast States.
Coryneum rhododendri Schw., ? leaf spot. Oregon, Wash.
Cryptostictis mariae (Clint.) Sacc., leaf spot. Pacific Coast States.
Diplodina eurhododendri Voss, on inflorescences. Oregon.
Exobasidium vaccinii (Fckl.) Wor., leaf gall. Pacific Coast States.
E. vaccinii-uliginosi Bond., witches'-broom. Oregon, Wash.
Lophodermium rhododendri (Schw.) Ell. & Ev., leaf spot, ? twig blight. Oregon, Wash.
Mycosphaerella sp., leaf spot. Wash.
Phacidium vaccinii Fr., on fallen leaves. Oregon.
Phyllosticta rhodorae (Cke.) F. Tassi, leaf spot. Oregon.

RHODODENDRON MAXIMUM L., ROSEBAY RHODODENDRON. Evergreen flowering shrub of Growth Regions 24, 26, 27; cult. for ornament, Zone III.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., dieback. Mass., N.J.
Briosia azaleae (Pk.) Dearn., bud & twig blight. Pa. to N.Car. & Tenn.

RHODODENDRON MAXIMUM -- continued.

Cercospora sp., leaf spot. Fla.
Coccomyces coronatus (Schum. ex Fr.) DeNot., on leaves & twigs. Ga., Va.
Coryneum triseptatum Pk., leaf spot. N.Y., Tenn.
Cryptostictis mariae (Clint.) Sacc., leaf spot. Ky., N.Y., Va.
Dermatea lobata Ell. (? D. brunneo-pruinosa Zeller), on leaves. N.Car., W.Va.
Discosia sp., leaf spot. N.Y.
Exobasidium vaccinii (Fckl.) Wor., leaf gall. Widespread.
Fomes applanatus (Pers. ex Fr.) Gill., trunk rot. N.Y.
Guignardia sp., leaf spot. N.J.
Hendersonia concentrica Ell. & Ev., leaf spot. W.Va.
Hymenochaete agglutinans Ell., trunk rot. Pa., Tenn.
Laestadia rhodorae (Cke.) Berl. & Vogl., leaf spot. N.Y.
Lophodermium rhododendri (Schw.) Ell. & Ev., leaf spot. Vt. to N.Car. & W.Va.
Mycosphaerella clintoniana House, leaf spot. N.Y.
Pestalotia macrotricha Kleb., gray blight, leaf spot. Conn. to Pa. & Va.
Pezicula rhododendricola Rehm, on branches. Pa.
Phomopsis sp., leaf spot, canker. N.Y.
Phyllosticta sp., leaf spot, dieback. N.J., N.Car.
  P. maxima Ell. & Ev., leaf spot. Mass. to Md.
  P. saccardoi Thüm., N.J., N.Y.
Physalospora rhododendri (DeNot.) Rehm, leaf spot. Pa., Tenn., Va.
  P. viscosa (Cke. & Ell.) Sacc., on leaves. Tenn.
Phytophthora cryptogea Pethyb. & Laf., root & collar rot. N.J.
Polyporus caesius Schrad. ex Fr. and P. pargamenus Fr., trunk rot. Ala., Va.
Sphaeropsis sp., dieback. N.J., Pa.
Sporonema oxycocci Shear, on leaves. Va.
Stereum rugosum Pers. ex Fr., trunk rot. Tenn.
Venturia rhododendri Tengwall (Phyllosticta maxima Ell. & Ev.), leaf spot. Va.

RHODODENDRON NUDIFLORUM (L.) Torr., PINXTERBLOOM AZALEA, of Growth Regions 25, 26, 27, 28, 29, 30; also R. CANESCENS (Michx.) Sweet, PIEDMONT AZALEA, of the southern part of this range and R. ROSEUM (Loisel.) Rehd., ROSESHELL AZALEA of the northern part. Deciduous shrubs, grown for ornament, Zone III.

Briosia azaleae (Pk.) Dearn., bud & twig blight. Mass., N.J.
Clithris azaleae (Schw.) Ell. & Ev., Va.
Colpoma azaleae (Schw.) Cke., on branches. Ga.
Dendrophoma azaleae Dearn. & House, on branches. N.Y.
Exobasidium burtii Zeller, yellow leaf spot. N.J.
  E. vaccinii (Fckl.) Wor., leaf spot, gall. Widespread.

RHODODENDRON NUDIFLORUM -- continued.

Microsphaera alni DC. ex Wint., powdery mildew. N.Y., Pa.
Monilinia azaleae Honey, shoot blight. Ga., N.Y.
Ovulinia azaleae Weiss, flower spot. S.Car.
Phyllosticta maxima Ell. & Ev., leaf spot. Ala.
Pucciniastrum myrtilli (Schum.) Arth., rust (II,III). Vt. to Pa. & Ala.
Ramularia angustata Pk., leaf spot. N.Y.

RHODODENDRON OCCIDENTALE Gray, WESTERN AZALEA. Flowering shrub of Growth Region 4, sometimes planted for ornament, Zone VI-VII.

Dermatea rhododendri Rehm, on branches. Calif.
Diaporthe eres Nits., on branches. Calif.
Erysiphe polygoni DC., powdery mildew.
Exobasidium decolorans Harkn. (? E. vaccinii (Fckl.) Wor.), leaf gall, leaf spot. Calif.
Septoria sp., leaf spot. Calif.
S. solitaria Ell. & Ev., Calif., Oregon.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

A ROSE UNDERSTOCK RESISTANT TO ROOT KNOT NEMATODE

E. W. Lyle and G. E. Altstatt

During 1940 and 1941 a hybrid rose understock, Rosa multiflora x R. blanda, which was developed by Mr. T. J. Maney of Iowa proved highly resistant if not immune to root knot nematode (Heterodera marioni). This understock was propagated with others under test in infested soil in small beds and also under general field conditions. Other varieties of understocks which were grown along side and failed to show resistance were: R. manetti, Ragged Robin, R. multiflora Welch, R. multiflora Shafter, and Texas Wax. R. setigera was severely infected, but grew well notwithstanding the amount of root knot which developed.

The multiflora-blanda cross in the relatively few tests made showed considerable variation in respect to percentage rooting and live under the conditions of East Texas. The live from cuttings varied from 45% to about 90%, depending on the season and location. Although it was not as dependable in live as certain other understocks, the value of resistance to root knot would more than compensate for this, especially for areas which are known to be infested with nematode.

The multiflora-blanda understock is known to be compatible with buds of many kinds of hybrid tea roses in addition to the fact that it is a thornless type which is easy to handle. The roots are not as smooth as R. multiflora which is commonly used, but they branch well and develop sufficiently to make a good understock. Microscopic examination as well as observations from symptoms have failed to demonstrate an infection by the root knot nematode.
(TEXAS AGRICULTURAL EXPERIMENT STATION, SUBSTATION NO. 2, TYLER, TEXAS.)

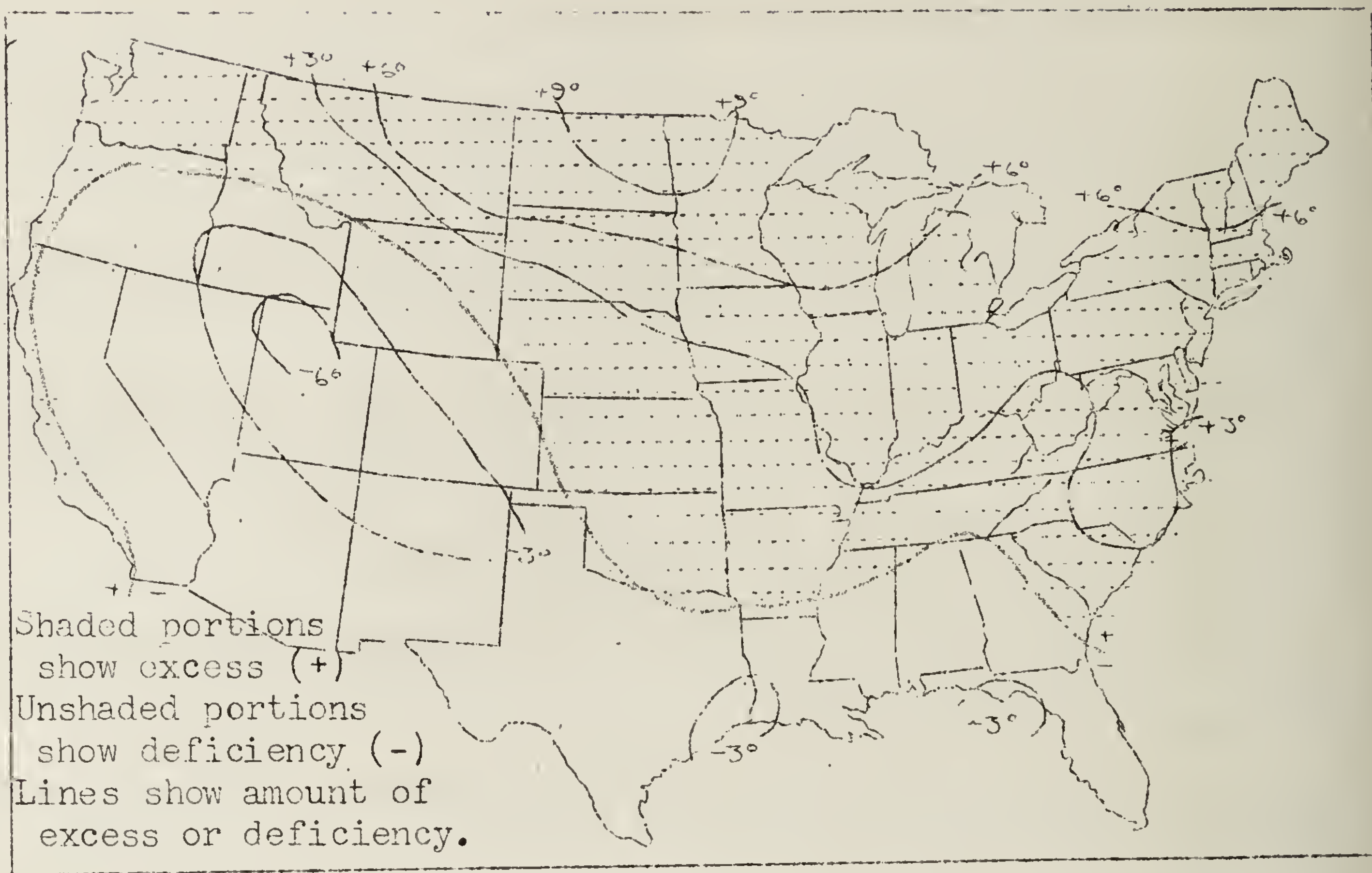

Figure 1.-- Departure of mean temperature from the normal for March 1942.

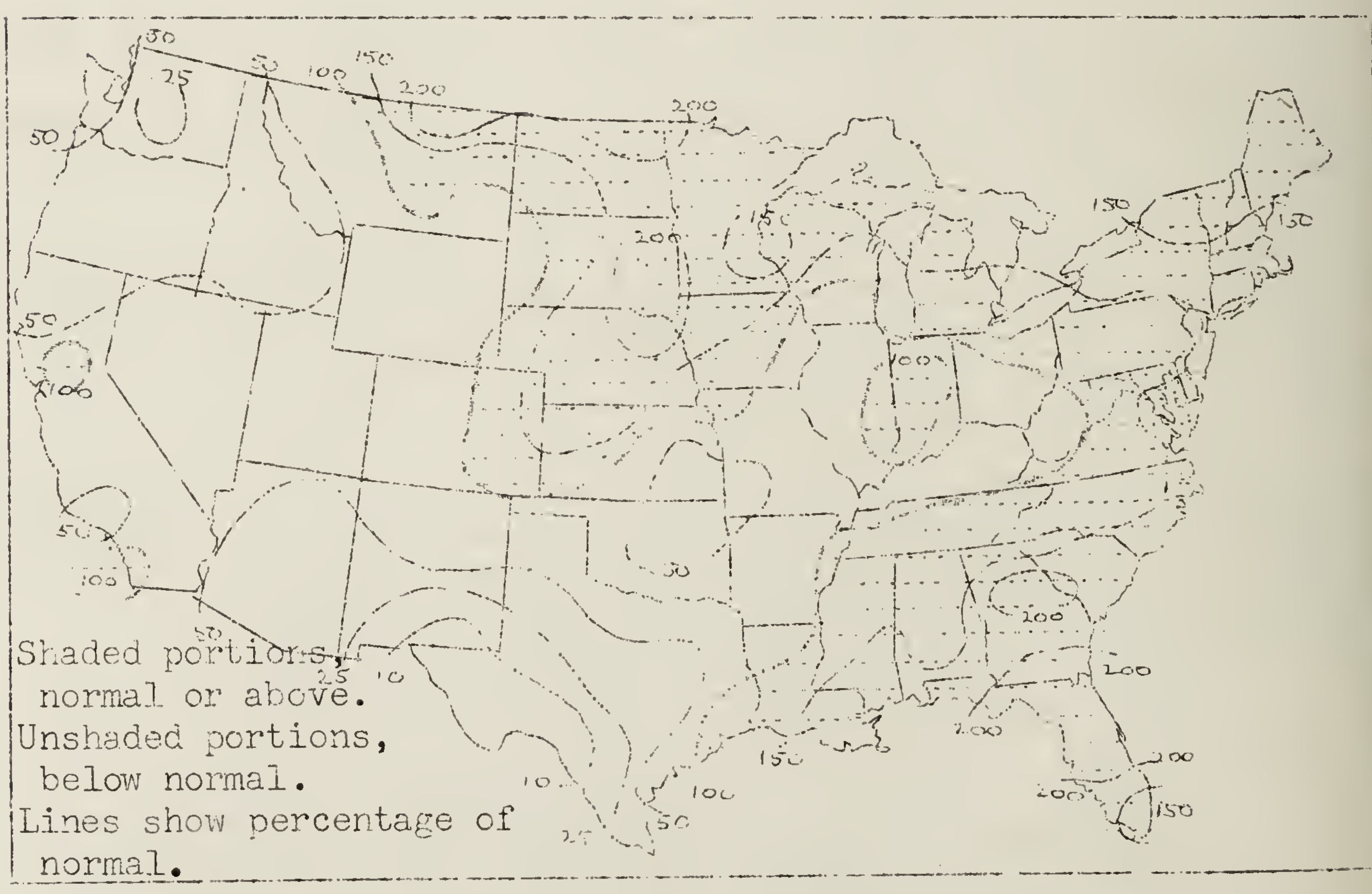

Figure 2.--Percentage of normal precipitation for March 1942.

MARCH WEATHER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending April 7, 1942).

The weather of March, 1942, shows in several respects conditions in marked opposition to March of the preceding year. The temperature in most of the eastern half of the country averaged above normal for the month, in contrast with large deficiencies for March last year, while a large southwestern area, where it was extremely wet a year ago, had scanty rainfall. Figure 1 shows that the mean monthly temperatures were near normal, mostly slightly below normal, in the Cotton Belt, but they were decidedly above normal in Northern States east of the Rocky Mountains. The largest plus anomalies occurred in the Northeast, the Lake region, the upper Mississippi Valley; and the northern Great Plains, where the month averaged from 5° to as many as 11° above normal. West of the Rocky Mountains temperatures were mostly deficient, although the minus anomalies were small in most sections, and about-normal warmth prevailed for the month as a whole in Pacific areas. The relatively coldest weather occurred in the eastern Great Basin where the temperature averaged 5° or 6° below normal.

Figure 2 shows marked contrasts in March precipitation in different parts of the country. The monthly totals were uniformly heavy in a large southeastern area and the Middle Atlantic and North Atlantic States; parts of the Southeast had more than twice the normal rainfall for the month. The amounts were heavy also in the upper Lake region and in a considerable north-central area extending from Kansas and Iowa northward; it was the wettest March of record in some localities. On the other hand, most of the Ohio and central Mississippi Valleys had less than normal rainfall and a large southwestern area was decidedly dry. This latter in March, 1941, had more than twice the normal rainfall, running up to 6 or 7 times the normal in some sections, while this year most of it had less than half the normal. The driest sections were western Texas and southern New Mexico. Del Rio, Texas, received only 0.01 inch for the entire month, 2% of normal, while El Paso had only 6 percent of normal. Some marked contrasts in nearby localities were in evidence, Concordia, Kansas, for example, having 172% of normal and nearby Topeka 48%. In the more western States the month was decidedly dry, especially in the Pacific Northwest where most stations reported less than half the normal precipitation. For the entire area west of the Rocky Mountains only a few widely scattered localities, principally in California, reported as much as normal precipitation for the month.

A CORRECTION

The host of Phyllachora cynodontis Niessl reported from Louisiana has been determined by Mrs. Agnes Chase as Muhlenbergia schreberi Gmel., not Cynodon dactylon (L.) Pers. as given in the report on page 152 of the preceding issue. (George Nyland, Department of Botany, Louisiana State University).

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IN THIS ISSUE

CHECK LIST REVISION

Freeman Weiss

RHODOTYPOS (ROSACEAE)

RHODOTYPOS SCANDENS (Thunb.) Mak., BLACK JETBEAD. Deciduous shrub of E. Asia, cult. for ornament, Zone IV.

Ascochyta rhodotypi H. W. Anderson, leaf spot. Ill.
Gloeosporium sp. (? G. nervisequum Fckl.), anthracnose. Ill.
Nectria cinnabarina Tode ex Fr., coral spot twig blight. Mass.

RHUS (ANACARDIACEAE)

RHUS AROMATICA Ait., FRAGRANT SUMAC. Shrub of Growth Regions 20, 22, 23, 24, 25, 26, 27, 28, 29; food plant for wild life, sometimes planted for ornament, Zone V. Also R. TRILOBAT[A] Nutt., SKUNKBUSH SUMAC, occurring from Ill. to the Pacifi[c] Coast.

Cercospora rhoina Cke. & Ell., on leaves. Ala., Calif., Mo.
Cladosporium aromaticum Ell. & Ev., on leaves. Calif.
Cuscuta exaltata Engelm., dodder. Texas.
Diplodia resurgens Cke. & Harkn., on branches. Calif.
Pezizella oenotherae (Cke. & Ell.) Sacc. (Hainesia rhoina Ell. & Sacc.) on leaves. N.J.
Phleospora irregularis (Pk.) Petr., leaf spot. Mont.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora mutila (Fr.) N.E. Stevens (Diplodia rhuina Cke. & Harkn.) on branches. Calif.
Pileolaria patzcuarensis (Holw.) Arth., rust (O,I,II,III). Colo., N.Mex., Okla. On R. trilobata.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Conn., Ind.
Verticillium albo-atrum Reinke & Berth., wilt. Mass.

RHUS COPALLINA L., FLAMELEAF SUMAC. Shrub or small tree of Growth Regions 20, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32; grown for ornament, Zone IV, and food plant for wildlife. Also R. MICHAUXI Sarg., MICHAUX SUMAC, of G.R. 28.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Ga.
Cercorpora rhoina Cke. & Ell. (C. copallina Cke.), on leaves. Mass. t[o] Fla., Texas & Kans.
C. r. var. nigromaculans Pk. N.Y.
Cryptodiaporthe aculeans (Schw.) Wehmeyer (Sporocybe rhois (Berk. & Curt.) Sacc.), dieback, canker. N.Y. to Ga., Miss. & Mo.
Cuscuta exaltata Engelm., dodder. Texas.
Cylindrosporium irregulare (Pk.) Dearn. (C. toxicodendri (Ell. & Mart[.]) Ell. & Ev.), leaf spot. See Phleospora.

RHUS COPALLINA -- continued

Daldinia concentrica Bolt. ex Fr., wood rot. Cosmopolitan.
Diaporthe spiculosa (Alb. & Schw. ex Fr.) Nits., on branches. Ala.
Dothidea rhois Schw. ex Fr., on leaves. N.Car.
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. Md., N.J., Va.
Phleospora irregularis (Pk.) Bubak, leaf spot. Widespread. (Reported variously as Gloeosporium, Septoria, Cylindrosporium and Marssonina, usually with the epithet toxicodendri.)
Phoma pulchella (Berk. & Curt.) Sacc., on branches. S.Car.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Polyporus poculum (Schw.) Berk. & Curt., wood rot. W.Va.
Poria cocos (Schw. ex Fr.) Wolf, root rot. Fla.
Septoria rhoina Berk. & Curt., leaf spot. Fla., Mich., N.J.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Vt. to Mo.
Sporocybe rhois (Berk. & Curt.) Sacc., on branches. Conidial stage of Cryptodiaporthe aculeans.
Stemphylium copallinum Ell. & Ev., on leaves. Ala.
Stereum rameale Schw. and S. sericeum Schw., wood rot. Md., W.Va.
Taphrina purpurascens (Ell. & Ev.) Robinson, leaf blister. Widespread.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on branches. Gulf States.

RHUS GLABRA L., SMOOTH SUMAC, and R. TYPHINA L., STAGHORN SUMAC. Shrubs or small trees, the former sp. occurring throughout the U. S. except the far West, the latter in the N.Central and Eastern States; both spp. furnish food for wildlife, and are grown for ornament, having cut-leaved forms.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. (? B. ambigua (Schw.) Sacc.), on branches. Ga., Pa., Va.
(B. sumachi (Schw.) Cke.): Physalospora obtusa.
Cercospora rhoina Cke. & Ell., on leaves. N.J. to Ala., Texas & Wis.
Cladosporium aromaticum Ell. & Ev., on leaves. Iowa, Nebr., Wis.
C. nervale Ell. & Dearn. Wis.
Corticium galactinum (Fr.) Burt., white root rot. Va.
Cryptodiaporthe aculeans (Schw.) Wehmeyer, dieback, canker. Me. to Ala. & Iowa.
Cryptosporella leptasca (Pk. & Clint.) Sacc., on branches. N.Y.
Cytospora grandis Pk., on branches. Ala., N.Y.
C. rhoina Fr. Mich., N.Y., W.Va.
Diaporthe spiculosa (Alb. & Schw. ex Fr.) Nits. (D. rhoina (Cke. & Ell.) Ell. & Ev.), on branches. Mass. to N.J. & Ill.
Mycosphaerella nigredo (Schw.) Lindau, on leaves. Pa.
Myxosporium rhois (Berk. & Curt.) Sacc., on twigs. W.Va.
Nectria cinnabarina Tode ex Fr., on branches. N.Y.
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot. Ga., Va., W.Va.
Phoma pulchella (Berk. & Curt.) Sacc., on branches. Me.
Phyllosticta sp., leaf spot. Minn.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

RHUS GLABRA -- continued

Physalospora spp., on branches, perhaps causing canker & dieback. P. fusca N.E. Stevens and P. rhodina (Berk. & Curt.) Cke., Fla.; P. obtusa (Schw.) Cke. (with numerous synonyms on Rhus as Botryosphaeria sumachi (Schw.) Cke., Haplosporella rhoina Dearn. & Barth. and H. sumachi (Schw.) Ell. & Ev., Macrophoma rhoina (Schw.) Sacc., and Sphaeropsis sumachi (Schw.) Cke. & Ell.), widespread.

Pileolaria effusa Pk., rust (O,III). Ariz. On R. cismontana Greene, a form of R. glabra.

Polyporus hirsutus Wulf. ex Fr., wood rot, sometimes on living plants.

Schizophyllum commune Fr., wood rot, sometimes on living plants. Widespread.

(Septoria irregularis Pk.): Phleospora irregularis.

S. rhoina Berk. & Curt. ex Sacc., leaf spot. Vt. to Kans. & Minn.

Sphaerotheca humuli (DC.) Burr., powdery mildew. Widespread.

Tryblidiella rufula (Spreng. ex Fr.) Sacc., on branches.

Verticillium albo-atrum Reinke & Berth., wilt. Ill., Iowa.

RHUS INTEGRIFOLIA (Nutt.) Benth. & Hook., LEMONADE SUMAC, SOURBERRY. Evergreen shrub of Growth Regions 5 & 10; the plant used for ground cover and the berries for beverage. Also several other evergreen spp. of the West Coast, as R. LAURINA Nutt., LAUREL SUMAC, R. OVATA Wats., SUGAR SUMAC and R. VIRENS Lindh., used for ground cover and ornament.

Armillaria mellea Vahl ex Fr., root rot. Calif.

Cercospora rhoina Cke. & Ell., on leaves. Texas.

Coniothyrium rhois Tharp, on leaves. Texas.

Harknessia rhoina Ell. & Ev., on leaves. Calif.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Telimena rhoina (Ell. & Ev.) Theiss. & Syd., on leaves. Calif.

Thyronectria virens Harkn., on twigs. Calif.

Xylogramma nigerrimum (Ell. & Ev.)Rehm, on twigs. Calif.

RHUS TOXICODENDRON L., POISON-IVY, POISON-OAK. Including R. DIVERSILOBA Torr. & Gray, POISON-OAK of the West Coast, and R. RADICANS L., POISON-IVY, of the Eastern States. Low shrubs to climbing vines distributed throughout the U.S.; poisonous to man, but serves as food for wildlife and forage for livestock.

Botryosphaeria ambigua (Schw.) Sacc., on stems. Calif., S.Car.

Cercospora bartholomaei Ell. & Kell., on leaves. Kans.

C. rhoina Cke. & Ell., Ala., Mont.

C. toxicodendri Ell., Mass. to Iowa & Texas; Calif.

Cuscuta exaltata Engelm., dodder. Texas.

Cylindrosporium irregulare (Pk.) Dearn. (C. toxicodendri (Ell. & Mart.) Ell. & Ev.). See Phleospora.

Diaporthe spiculosa (Alb. & Schw. ex Fr.) Nits. (D. rhoina Cke. & Ell.) on stems. Ill.

D. peckii (Sacc.), on stems. Mich., N.Y.

RHUS TOXICODENDRON -- continued.
Helicobasidium purpureum (Tul.) Pat., root rot. Texas.
Ophiocarpella tarda (Harkn.) Theiss. & Syd., on leaves. Calif.
Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves & stems. N.Y., Tenn., Va.
Phleospora irregularis (Pk.) Bubak, leaf spot. Widespread.
Phoradendron villosum Nutt., mistletoe. Calif., Oregon.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich., Wash.
Phyllosticta rhoicola Ell. & Ev., on leaves. N.Y., W.Va.
P. toxica Ell. & Mart. Ill., Iowa, Miss.
P. toxicodendri Thüm. S.Car.
Physalospora obtusa (Schw.) Cke., on stems or branches. N.Y.
Pileolaria effusa Pk., rust (O,III). Colo. (On R. rydbergii).
P. mexicana Arth., rust (II). Texas. On R. chloriophylla.
P. toxicodendri (Berk. & Rav.) Arth., rust (O,I,II,III). General.
Polyporus spp., wood rot, sometimes of living plants. P. adustus Willd. ex Fr., Md.; P. arcularius Batsch ex Fr., Va.; P. dryadeus Pers. ex Fr.; P. gilvus (Schw.) Fr., Md.; P. hirsutus Wulf. ex Fr., Md.; P. unitus Pers., Mich.
Septoria irregularis Pk. (S. toxicodendri (Ell. & Mart.) Mart.) See Phleospora irregularis.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on stems & twigs. Calif., Ga., Miss.

RHUS VERNIX L., poison sumac. Shrub or small tree of Growth Regions 22, 23, 24, 25, 26, 27, 28, 29, 30; furnishes food for wildlife.

Cercospora infuscans Ell. & Ev., on leaves. Del.
C. rhoina Cke. & Ell. Ala.
Cryptodiaporthe aculeans (Schw.) Wehmeyer, on branches. Md., N.J.
Diaporthe spiculosa (Alb. & Schw.) Nits., on branches. Ill., Mass., N.J.
D. peckii Sacc. Mich.
Hypoxylon morsei Berk. & Curt., on branches, ? canker. Ind., N.Y.
Phyllosticta rhoina Kalchbr. & Cke., on leaves. Mich.
Physalospora obtusa (Schw.) Cke., on branches. N.J.
Schizophyllum commune Fr., wound rot. Mass.
Sphaeronema pruinosum Berk. & Curt., on branches. Pa.

RIBES (SAXIFRAGACEAE)

RIBES spp., CURRANTS, GOOSEBERRIES. The numerous spp. of Ribes can be grouped for the purpose of this list into (1) currants cult. for fruit, (2) currants cult. for ornament, (3) cult. gooseberries, (4) native spp., both currants & gooseberries, chiefly furnishing food for wildlife.

RIBES spp. (1), Currants cult. for fruit. R. SATIVUM Syme, COMMON RED CURRANT, native of W. Europe, cult., Zone IV, and locally naturalized in the East and N. Central States; R. RUBRUM L., NORTHERN RED CURRANT, native of C. and N. Europe and Asia, not cult. as such in the U.S. but a progenitor of the hardiest currant hybrids, Zone III; R. NIGRUM L., EUROPEAN BLACK CURRANT, native of Europe to C. Asia, Zone

Alternaria sp., leaf spot. Mich.
Armillaria mellea Vahl ex Fr., root rot. Calif., Oregon, Wash.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. var. chromogena Shear et al., cane blight. Mass. to Va. & Ill.; Calif. The non-chromogenic form is probably saprophytic.
Botrytis cinerea Pers., dieback, leaf spot, gray mold of fruit. N.E. States, Oregon, Wash.
(Cenangium ribis Fr.): Scleroderris ribis (Fr.) Keissler?, on twigs. Calif.
Cercospora angulata Wint., angular leaf spot. N.Y. to Va., Kans. & Minn.
C. ribis Earle. Ala., Ind., Iowa.
Corticium stevensii Burt, thread blight. Fla.
Cronartium ribicola Fischer, white pine blister rust (II,III). Me. to Va., Ill. & Minn.; Oregon, Wash. 0 and I on 5-needle pines. (The var. Viking (R. petraeum x R. rubrum) is highly resistant).
Cylindrosporium ribis Davis, leaf spot. Wis.
Cytospora grossulariae Laubert, on twigs. Md.
(Dothidella ribesia (Pers. ex Fr.) Theiss. & Syd.): Phragmodothella ribesia.
(Dothiorella ribis (Fckl.) Sacc.): Botryosphaeria ribis.
Fomes ribis (Schum. ex Fr.) Gill., collar rot. N.Y. to Ind.& Minn.; Utah.
Gloeosporium ribis (Lib.) Mont. & Desm. (Gloeosporidiella ribis (Lib.) Petr.). Conidial stage of Pseudopeziza ribis.
Glomerella cingulata (Ston.) Spauld.& Schrenk, berry rot. Conn.
Hypholoma perplexum Pk., root rot. N.Y.
Leptosphaeria coniothyrium (Fckl.) Sacc., on canes. Alaska.
L. vagabunda Sacc. Mich.
(Macrophoma hyalina (Berk. & Curt.) Berl. & Vogl.): Physalospora obtu
Microsphaera grossulariae (Wallr.) Lév., European powdery mildew. Mo Nebr., N.H.
Mycosphaerella ribis (Fckl.) Feltgen (Septoria ribis Desm.), leaf spot. Me. to Md., Ark., Oregon & Wash. (The change from the more familiar M. grossulariae (Fr.) Lindau is due to the fact that Sphaeria grossulariae Fr. on which this is based appears to be a quite different fungus from that causing leaf spot. The latter was described as Sphaerella ribis Fckl. in 1869; the change to Mycosphaerella is often ascribed to Klebahn (1918) but was published by Feltgen in 1899.)
Nectria cinnabarina Tode ex Fr., coral spot canker; dieback. Me. to Colo. & Wash.; Alaska
N. ditissima Tul. (? N. coccinea Pers. ex Fr.), canker. Minn., N.Y

RIBES spp. (1) -- continued.

Phragmodothella ribesia (Pers. ex Fr.) Petr., black pustule, dieback. N.E. States, Pacific Northwest, Alaska.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.
Phyllosticta grossulariae Sacc., leaf spot. N.J., N.Y., Wis. (Spermatial stage of Mycosphaerella ribis?)
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on dead canes. Mass. to Va. & Mich.
Plasmopara ribicola Schroet., downy mildew. Wis.
(Plowrightia ribesia (Pers. ex Fr.) Sacc.): Phragmodothella ribesia.
Pseudopeziza ribis Kleb. (Gloeosporium ribis (Lib.) Mont. & Desm.), anthracnose (leaf, stem & fruit spot). General. (Recent authors have called this Drepanopeziza ribis (Kleb.) Höhn.)
Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (0,I). Conn., Ind., Md., N.Y., Alaska. II & III on Carex spp.
P. ribis DC., rust (III). Ohio to Minn. & Nebr.
Septoria ribis Desm. (S. grossulariae (Lib.) Westend. and S. sibirica Thüm.). Conidial stage of Mycosphaerella ribis.
(Sphaeropsis hyalina Berk. & Curt. and S. ribicola Cke. & Ell.): Physalospora obtusa.
Sphaerotheca mors-uvae (Schw.) Berk. & Curt., American powdery mildew. Calif., Conn., Mont., Nebr., Wash., Alaska.
Thyronectria berolinensis (Sacc.) Seaver, cane knot. Conn. to Ind., Kans. & Utah.
Verticillium sp., wilt. N.Y.
Crinkle leaf, cause unknown. N.Y.
Mosaic, undet. virus. Md., N.Y. On red currants.
Witches'-broom, cause unknown. N.Y.
Yellow leaf, cause unknown. N.Y.

RIBES spp. (2) Currants cult. for ornament. R. AUREUM Pursh, GOLDEN CURRANT, shrub of Growth Regions 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 15, 22, 23; cult., Zone II; R. ODORATUM Wendl., CLOVE CURRANT, of G.R.'s 15, 16, 18, 19, 20, 22, 23, 25; cult., Zone IV; R. SANGUINEUM Pursh, RED-FLOWERED CURRANT, of G.R.'s 1, 2, 4; cult., Zone V. Several other native currants, some vars. of R. NIGRUM, and R. ALPINUM L., ALPINE CURRANT, of Europe, also are grown for ornament.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., dieback. Kans.
Botrytis cinerea Pers., dieback, ? witches'-broom: Alaska, Ind.
Cercospora angulata Wint., angular leaf spot. Minn.
C. ribicola Ell. & Ev., leaf spot. Oregon, Wash.
Coleosporium jonesii (Pk.) Arth., rust (II,III). Minn. to Ariz. and Idaho. 0 & I on Pinus edulis.
Cronartium occidentale Hedgc., Bethel & Hunt, piñon blister rust. Mont. to N.Mex. Calif. & Wash. Especially on R. aureum; 0 & I on P. monophylla and P. edulis.
C. ribicola Fischer, white pine blister rust (II,III). Me. to Md., Colo., & Minn. on R. aureum or R. odoratum; Pacific Coast States on R. sanguineum. Some pistillate clones of R. alpinum are susceptible but at least one staminate clone is immune.

RIBES spp. (2)-- continued.

Glomerella cingulata (Ston.) Spauld. & Schrenk, berry rot. Conn.
Marssonina ribicola (Ell. & Ev.) P. Magn., leaf spot. Colo.
Melampsora ribesii-purpureae Kleb., rust (0,I). Utah. On R. aureum. II & III on Salix spp.
Mycosphaerella aurea (Ell. & Ev.) Stone (Septoria aurea Ell. & Ev. and var. destruens Ell. & Ev.), leaf spot. N.Y. to Kans. & S.Dak. Wash.
M. ribis (Fckl.) Feltgen, leaf spot. N.Y. to Kans., Minn. & Utah.
Nectria cinnabarina Tode ex Fr., coral spot dieback. Alaska, Kans.
Phragmodothella ribesia (Pers. ex Fr.) Petr., black pustule, dieback. N.Y.
Phyllosticta grossulariae Sacc., leaf spot. Ind.
Pseudopeziza ribis Kleb., anthracnose. Minn., Mont.
Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (0,I). N.Y. to Iowa, Calif. & Oregon; Alaska
P. micrantha Griff., rust (0,I). Nebr., Wyo. On R. aureum. II & III on Oryzopsis micrantha.
P. parkerae Diet. & Holw., rust (III). Wash. On R. sanguineum.
Septoria aurea Ell. & Ev. : Conidial stage of Mycosphaerella aurea.
S. sanguinea Dearn., leaf spot. Wash.
Thyronectria berolinensis (Sacc.) Seaver, cane knot. Kans.

RIBES spp. (3), Cultivated gooseberries. R. GROSSULARIA L., EUROPEAN GOOSEBERRY, shrub of Europe and W. Asia, parent of hort. vars. infrequently cult. in U.S., Zone IV, and of hybrids with the following: R. HIRTELLUM Michx., HAIRYSTEM GOOSEBERRY, shrub of Growth Regions 15, 18, 21, 23, 24, 26, 27; principal source of American cult. vars., Zone III.

Aphelenchoides fragariae (Ritzema Bos) Christie, infesting buds. Calif.
Armillaria mellea Vahl ex Fr., root rot. Oregon, Wash.
Botryosphaeria ribis Tode ex Fr., cane blight. N.J., Va.
Botrytis cinerea Pers., dieback. Conn., Oregon, Wash.
Cercospora angulata Wint., leaf spot. N.Y. to Mich. & Mo.
Coleosporium jonesii (Pk.) Arth., rust (II,III). Colo., Minn., N.Mex., Wis., Wyo.
Corticium stevensii Burt, thread blight. Fla.
Cronartium occidentale Hedgc., Bethel & Hunt, rust (II,III). Ariz., Colo., Utah.
C. ribicola Fischer, rust (II,III). Vt. to Va. & Minn.; Calif. (Chiefly on American gooseberries, the European vars. being resistant).
Cuscuta sp., dodder. Minn., N.Y.
Dematophora sp., root rot. N.Y.
Diaporthe eres Nits.(D. concrescens (Schw.) Cke. and D. pungens Nits.) on twigs. Alaska.
Hendersonia grossulariae Oud., on canes. N.Y.
Leptosphaeria coniothyrium (Fckl.) Sacc. (Coniothyrium fuckelii Sacc.), cane blight. Ind., Mo.
L. vagabunda Sacc. (?Coniothyrium ribis Brun.), on canes & twigs. Alaska.

RIBES spp. (3) -- continued.

Marssonina grossulariae (Oud.) P. Magn., leaf spot. Ohio, Wis. (? Septoria ribis Desm.).

Microsphaera grossulariae (Wallr.) Lév., European powdery mildew. Calif., Idaho.

Mycosphaerella ribis (Fckl.) Feltgen (Septoria ribis Desm.), leaf spot. Mass. to Va., Kans. & Minn.; Oregon to Alaska.

Nectria cinnabarina Tode ex Fr., coral spot dieback. Minn.

Phoma ribis Ell. & Barth., on twigs. Kans.

Phragmodothella ribesia (Pers. ex Fr.) Petr., twig knot, dieback. Oregon.

Phyllactinia corylea Pers. ex Karst., powdery mildew. N.Y.

Phyllosticta grossulariae Sacc., leaf spot, fruit spot. Conn., N.J., Wash., Wis.

Physalospora obtusa (Schw.) Cke., dieback. N.Y. to Va. & Kans.

Plasmopara ribicola Schroet., downy mildew. Minn., Oregon, W.Va., Wis.

Pseudopeziza ribis Kleb., anthracnose. General.

Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (O,I) on leaves & fruit. Me. to Md., Miss., Kans. & Idaho, Alaska.

P. caricis uniporula (Orton) Arth., rust (O,I). Iowa, Md., N.Y., Wis.

Ramularia sp., leaf spot. Mich.

Sphaerotheca humuli (DC.) Burr., powdery mildew. Ind., Minn.

S. mors-uvae (Schw.) Berk. & Curt., American powdery mildew. General.

Xylaria hypoxylon (L.) Grev., black root rot. Oregon.

Mosaic, unident. virus. Ill., N.Y.

Rosette, cause unknown. Del.

RIBES spp. (4), Miscellaneous native spp. Some furnish edible fruit as R. AMERICANUM Mill., AMERICAN BLACK CURRANT; R. HUDSONIANUM Rich., HUDSON BAY CURRANT; R. TRISTE Pall., SWAMP RED CURRANT; R. INERME Rydb., WHITESTEM GOOSEBERRY; R. OXYACANTHOIDES L., NORTHERN GOOSEBERRY; some are grown for ornament as R. CEREUM Dougl., WAX CURRANT, and R. SPECIOSUM Pursh, FUCHSIA GOOSEBERRY.

Armillaria mellea Vahl ex Fr., root rot. Wash.

Asteroma ribicola Ell. & Ev., on leaves. Mont., N.Y., Wis.

Botryosphaeria ribis (Tode Ex Fr.) Gross. & Dug. and var. chromogena Shear et al., cane blight, dieback. Calif., Conn., Md., N.J.

Cenangella oricostata Cash, on twigs. Colo., Utah.

Cercospora angulata Wint., leaf spot. Kans.

C. coalescens Davis, on leaves. Wash.

C. ribicola Ell. & Ev., Calif., Oregon, Wyo., Wis., Wash., Idaho.

C. ribis Earle. Kans.

Ceriospora ribis P. Henn. & Plottn. on canes. Alaska, Oregon.

Clypeopycnis aeruginascens Petr., on twigs. Alaska, S.Dak.

Cladosporium sp. and C. herbarum Lk., leaf blight. Alaska, Wash.

Coleosporium jonesii (Pk.) Arth., rust (II,III). Wis. to N.Mex., Calif. & Wash. On currants & gooseberries; O & I on Pinus edulis.

Coniophora corrugis Burt, wood rot. Wyo. to Ariz.

RIBES spp. (4) -- continued.

Cronartium occidentale Hedgc., Bethel & Hunt, piñon blister rust (II, III). Kans. to N.Mex., Calif. & Wash. O & I on Pinus edulis & P. monophylla.

C. ribicola Fischer, white pine blister rust (II,III). Me. to N.Car., Tenn., Iowa & Minn.; Mont. to Wash., Oregon & Calif. O & I on 5-needle pines. (The native spp. are generally susceptible, but R. leptanthum Gray is somewhat resistant.)

Cucurbitaria ribis Niessl, on dead canes. Mont., N.Mex., Va. Colo.

Cylindrosporium ribis Davis, leaf spot, N.Y., Wis.

Diaporthe eres Nits. (D. concrescens (Schw.) Cke., on dead canes. Alaska.

D. strumella (Fr.) Fckl., on dead canes & twigs. Mass. to Mich. & Nebr.; Calif., Alaska.

Gloeosporium bartholomaei Dearn., leaf spot. Wash.

Godronia urceolus (Alb. & Schw. ex Fr.) Karst. (? Mastomyces uberiformis (Fr.) Karst.), on twigs. Alaska, Colo., N.J., N.Dak.

G. davidsoni Cash, Alaska, Colo., Calif.

Graphiothecium vinosum Davis, on leaves. Wis.

Hendersonia grossulariae Oud. Va.

Leptosphaeria coniothyrium (Fckl.) Sacc., on canes. Ind.

L. vagabunda Sacc. Utah.

Marssonina bracteosa Dearn. & Barth., on leaves. Alaska, Wash.

Melampsora ribesii-purpureae Kleb., rust (O,I). Colo. to Calif. & Wash.; Alaska. II & III on Salix spp.

Microsphaera grossulariae (Wallr.) Lév., European powdery mildew. Mont., N.H.

Mycosphaerella ribis (Fckl.) Feltgen (Septoria ribis Desm.), leaf spot. Mass. to Tenn. and Mo., Pacific Coast.

Nectria cinnabarina Tode ex Fr., canker, dieback. Widespread.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves. Me., Md.

Phragmodothella ribesia (Pers. ex Fr.) Petr. (? P. kelseyi (Ell. & Ev.) Theiss. & Syd.), twig knot. Conn. to Miss. & Wis.; Colo. to Mont. & Oregon; Alaska.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Idaho, Ill., N.Car.; Calif., Wash.

Phyllosticta spp., on leaves. P. canescens Ell. & Ev., Idaho; P. ellisii Sacc. & D. Sacc., W.Va.; P. grossulariae Sacc., Mich. to Ind., Kans. & Wis.; P. ribesicida Speg., Alaska; P. ribis Speg., Va.

Physalospora obtusa (Schw.) Cke., on dead branches. Me. to N.J. and Mich.

Plasmopara ribicola Schroet., downy mildew. Va. to Wis. & Wash.

Polyporus planus Pk., on dead canes. N.Car.

Pseudopeziza ribis Kleb. (Gloeosporium ribis (Lib.) Mont. & Desm.), anthracnose. Widespread. (Gooseberries are generally more severely infected than currants, but some spp. in each group are resistant.)

Pseudovalsa ribesia Sacc. & Scalia, on twigs. Alaska.

RIBES spp. (4) -- continued.

Puccinia caricis (Schum.) Schroet. var. grossulariata Arth., rust (0,I) Me. to Mo.,Calif. and Alaska. On various Ribes spp., both currants & gooseberries; II & III on Carex spp.
P. caricis var. uniporula (Orton) Arth. Similar, reported chiefly on cult. & native gooseberries. N.H. to Ind., Iowa & Wis.
P. micrantha Griff., rust (0,I). Colo., Mont., Nebr., S.Dak., Wyo., Utah. On currants & gooseberries; II & III on Oryzopsis micrantha.
P. parkerae Diet. & Holw., rust (III). Alaska to Mont. & Oregon. On currants & gooseberries.
P. ribis DC., rust (III). Me. to Minn. & Nebr.; Wash. On cult. & native currants.
Ramularia sp., leaf spot. Mich.
Rhabdospora ribicola (Berk. & Curt.) Sacc., on twigs. Wis.
Rhyncophoma raduloides Sacc. & Scalia. Alaska, Calif.
Rosellinia parasitica Ell. & Ev., on dead canes. Idaho, N.Mex.
Scleroderris lobata Cash, on dead twigs. Calif.
S. tumoricola Cash, on twig galls. Colo.
Septoria ribis Desm. (S. grossulariae (Lib.) Westend., S. sibirica Thüm.). Conidial stage of Mycosphaerella ribis.
S. sanguinea Dearn., leaf spot. Wash.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Alaska, Mont.
S. mors-uvae (Schw.) Berk. & Curt., American powdery mildew. Me. to Mo., Calif. & Wash.; Alaska. On both currants & gooseberries.
Thelephora terrestris Ehr. ex Fr., stem girdle. N.H.
Thyronectria berolinensis (Sacc.) Seaver, on canes & twigs. Md. to Ohio, S. Dak. & Oregon.
Valsa spp., on dead twigs & canes. V. ambiens Pers. ex Fr., N.J.; V. ribesia Karst., Calif.; V. ribicola Ell. & Ev., Kans., Mo.

RICINUS (EUPHORIBIACEAE)

RICINUS COMMUNIS L., CASTOR-BEAN. Shrub or small tree of tropical Africa(?), widely naturalized in warm regions; herbaceous and grown as an annual in temperate regions for castor oil obtained from the seeds and for ornament. Variable, occurring in many forms, sometimes separated as spp.

Alternaria sp., leaf spot. Fla., La., Texas.
A. brassicae (Berk.) Sacc. N.Y.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. and var. chromogena Shear et al., on stems. Fla., T.H.
Botrytis sp., gray mold. Conidial stage of Sclerotinia ricini.
Cercospora canescens Ell. & Mart., leaf spot. Ala., Kans., Mo.,N.J., P.R.
C. ricinella Sacc. & Berl., white leaf spot. Gulf States, Mo., Calif., West Indies. (Perhaps more commonly known as Cercosporina ricinella (Sacc. & Berl.) Speg.)

RICINUS COMMUNIS -- continued.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Didymella ricini Ell. & Ev., on stems. La.
Diplodia sp., on capsules or stems. Fla., Tenn.
D. natalensis Pole-Evans, on stems. Ala. See Physalospora.
Fusarium scirpi Lamb. & Fautr. var. acuminatum (Ell. & Ev.) Wr. and F. sambucinum Fckl., on stems. La.
Heterosporium sp., on capsules & leaves. Calif.
Phomopsis ricini Grove, on stems. S.Car.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora sp., on stems & capsules. P. fusca N.E. Stevens, Fla.; P. obtusa (Schw.) Cke.; P. rhodina (Berk. & Curt.) Cke. Ala., Fla.
Phytomonas solanacearum (EFS.) Bergey, bacterial wilt. Ala., Fla., Ga., Mich.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Despite the extensive use of Ricinus as an experimental host, there are no reports of natural crown gall infection in the U.S.
Phytophthora palmivora Butl., T.H.
P. parasitica Dastur var. nicotianae Tucker, stem rot. Known only from experimental inoculation in the U.S., including P.R., though reported to cause seedling blight in India and the East Indies.
Pythium spp., root rot. T.H.
Rhizoctonia solani Kühn, damping off. Fla., Kans.
Schizophyllum commune Fr., on stems. Fla.
Sclerotinia ricini Godfrey, inflorescence blight, gray mold. Ga. to Fla. & Texas. Conidial stage is Botrytis sp.
Sclerotium rolfsii Sacc., Southern wilt. Fla.

ROBINIA (LEGUMINOSAE)

ROBINIA HISPIDA L., ROSE-ACACIA. Shrub of Growth Regions 25, 27, 28; cult. for ornament, Zone V.

Alternaria fasciculata (Cke. & Ell.) Jones & Grout (? A. tenuis Nees ex Wiltshire), leaf spot. N.Dak.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on twigs. Ala.

ROBINIA PSEUDOACACIA L., BLACK LOCUST. Large but short-lived tree of eastern N. America, widely cult. and naturalized, Zone III; grown for timber, soil conservation, shade and ornament in numerous geographic and hort. forms.

Aglaospora anomia (Fr.) Lamb. (A. profusa (Fr.) Ces. & DeNot.), canker, twig blight. Me. to Ga. & Mich.
Alternaria sp., seedling leaf blight. N.Car. to Ala. & Mo.
Armillaria mellea Vahl ex Fr., root rot.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Ga., Tenn., Va.

ROBINIA PSEUDOACACIA -- continued.
Calonectria dearnessi Ell. & Ev., on branches. Mo.
Cladosporium epiphyllum Pers. ex Fr., ? leaf spot. Tenn., W.Va.
Coryneum trimerum Sacc., on branches. Idaho, Wash.
Cryptosporium robiniae Dearn. & House, on twigs. N.Y.
Cucurbitaria elongata (Fr.) Grev. (Camarosporium robiniae (Westend.) Sacc.), on branches. Widespread.
Cuscuta sp. and C. arvensis Beyr., dodder, on seedlings. Md. to Ark. & Mo. Widespread.
Cylindrosporium solitarium Heald & Wolf, leaf spot. Texas. See also Phleospora.
Cytospora coccinea (Reb.) Fr. and C. leucosperma Pers. ex Fr. Conidial stage of Aglaospora anomia.
(C. orthospora Berk. & Curt. and C. robiniae Schw.): Phomopsis oncostoma.
Daedalea unicolor Bull. ex Fr., wood rot. Wis.
Diaporthe oncostoma (Duby) Fckl. (Phomopsis oncostoma (Thüm.) Höhn.), canker, dieback. N.Y. to Ga. & Ill.
Dothiorella glandulosa (Cke.) Sacc., on branches. Va., W.Va.
Erysiphe polygoni DC., powdery mildew. Calif.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled heart rot. Calif.
F. igniarius (L. ex Fr.) Kickx, white spongy heart rot. Ill., W.Va.
F. rimosus (Berk.) Cke., yellow spongy heart rot. Mass. to Ala., N. Mex. & Wis. On living trees.
Fusarium sp., seedling root rot. Ala., Ga.
F. avenaceum (Fr.) Sacc., on twigs. Pa.
F. sarcochroum (Desm.) Sacc., twig canker. Iowa.
Fusicladium robiniae Shear, seedling leaf blight. Md. to Ala., Mo. & Wis.
Gibberella baccata (Wallr.) Sacc. (Fusarium lateritium Nees), on twigs. Mich., S.Car.
Gloeosporium revolutum Ell. & Ev., leaf spot. N.J.
Herpotrichia lanuginosa (Berk. & Curt.) Ell. & Ev., on decaying wood. S.Car., Va.
Heterodera marioni (Cornu) Goodey, root knot. Okla.
Macrophoma numerosa Pk., on branches. N.Y., Pa.
Microsphaera diffusa Cke. & Pk., powdery mildew. Ill., N.Car.
Melanconium viscosum Schw., on dead branches. Mo., Pa.
Nectria cinnabarina Tode ex Fr., on branches. Widespread.
N. coccinea Pers. ex Fr. W.Va.
Phleospora robiniae (Lib.) Höhn., leaf spot. N.Y. to Ohio & Wis. (Reported also as Cylindrosporium or Septoria.)
Phoradendron flavescens (Pursh) Nutt., mistletoe. N.Car.
P. f. var. macrophyllum Engelm. Ariz., N.Mex.
Phyllactinia corylea Pers. ex Karst., powdery mildew. N.Mex.
Phyllosticta robiniae Sacc., leaf spot. La.
Phymatotrichum omnivorum (Shear) Dug., root rot. Okla., N.Mex., Tex.
Physalospora obtusa (Schw.) Cke., on branches. Mo. to Va. & Mich.; Kansas.
Phytophthora cinnamomi Rands, seedling stem rot. Md.
P. parasitica Dastur, seedling top wilt. Ala., N.Car., Va.

ROBINIA PSEUDOACACIA -- continued.

Polyporus robiniophilus (Murr.) Lloyd, white spongy heart rot. Pa. to Va., Mo. & Mich.

P. sulphureus Bull. ex Fr., brown cubical heart rot. Mass., N.Y., W.Va.

Polyporus spp., wood rot, sometimes sapwood or heart rot of living trees. P. biformis Klotzsch, Ky.; P. gilvus (Schw.) Fr., W.Va.; Wis.; P. hirsutus Wulf. ex Fr., N.Y.; P. obtusus Berk., Md.; P. unitus Pers., Idaho, Ind., Ky., Va.

Poria spp., wood rot. P. ambigua Bres., Mich.; P. ferruginosa (Schrad. ex Fr.) Bres., W.Va.; P. incrassata (Berk. & Curt.) Burt, on posts, widespread; P. robustus Karst., Calif.; P. umbrina Fr., Md., Va.

(Pseudovalsa profusa (Fr.) DeNot.): Aglaospora anomia.

Pythium spp., damping off. Nebr., Texas.

P. myriotylum Dreschsler, seedling root rot. N.Car.

Rhabdospora breviuscula (Berk. & Curt.) Sacc., on branches. S.Car.

Rhizoctonia bataticola (Taub.) Butler, seedling stem rot. Ala., N.Car.

R. solani Kühn, damping off, seedling leaf blight. Md. to Ala., Texas & Nebr.

(Septoria curvata (Rabh. & Br.) Sacc.): Phleospora robiniae.

(Sphaeropsis robiniae Ell. & Barth.): Physalospora obtusa.

Verticillium albo-atrum Reinke & Berth., wilt. Ill.

Xylaria longeana Rehm and X. polymorpha (Pers.) Grev., wood rot, usually on stumps or dead trunks. Cosmopolitan.

Chlorosis, -- mineral deficiency, probably iron, in alkaline soil. Nebr., Texas.

Little leaf, -- zinc deficiency. Calif.

Witches'-broom (brooming disease), Hartley & Haasis ex Smith (Chlorogenus robiniae Holmes). Pa. to Ga. & Ark.; ?Nev.

ROBINIA spp. Especially R. NEOMEXICANA Gray, NEW MEXICO LOCUST, shrub or small tree of Growth Regions 9, 10, 11, 14; and R. VISCOSA Vent, CLAMMY LOCUST, tree of G.R.'s 27, 28, 29, cult. Zone III.

Cucurbitaria elongata (Fr.) Grev., on branches. N.Y.

Fomes rimosus Berk., yellow spongy heart rot. Ariz., N.Mex.

Melanconium viscosum Schw., on twigs. Pa.

Phomopsis oncostoma (Thüm.) Höhn., on twigs. N.J.

Phyllactinia corylea Pers. ex Karst., powdery mildew. N.Mex.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Physalospora obtusa (Schw.) Cke., on branches. Pa.

ROLLINIA (ANNONACEAE)

ROLLINIA DELICIOSA Safford, BIRIBA. Tropical American cult. for edible fruit in West Indies and S. Fla.

Glomerella cingulata (Ston.) Spauld. & Schrenk, dieback, fruit rot. Fla.

RONDELETIA (RUBIACEAE)

RONDELETIA spp. Evergreen shrubs or trees; some are grown for ornament in tropical America, or under glass.

Echidnodella rondeletiae Ryan, black leaf spot. P.R.
Morenoella decalvans (Pat.) Theiss. var. rondeletiae Ryan, on leaves. P.R.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

NOTES ON PLANT DISEASES IN KANSAS IN 1941[1/]

C. O. Johnston

During the period from 1935 to 1938, the writer, in collaboration with others, published a series of articles dealing with annual observations on plant diseases in the State, entitled "Kansas Mycological Notes" in the Transactions of the Kansas Academy of Science (1), (2), (3), (4).

The present article is a revival of that series of notes and it is planned to prepare similar articles annually. These will record the important or unusual plant disease developments in the State, as well as the prevalence and severity of certain economically important diseases each year. It is not claimed that the list will be complete for all of the diseases occurring in Kansas each year, but it will include all those of importance.

The unusual weather conditions that prevailed in much of Kansas during the spring and summer of 1941 favored many unusual disease developments on cultivated crops and native vegetation. In the western part of the State good rains during the late summer and fall of 1940, with the consequent restoration of subsurface soil moisture, resulted in a considerable increase in the vegetation and produced the best stands and growth of winter wheat that had been obtained in that area in many years. These conditions followed by a mild winter and exceedingly heavy rains in May and June 1941, and a second period of heavy rains in September and October, resulted in unusually heavy infections of many diseases.

Important or Unusual Development of Diseases of Cereal, Forage, and Fiber Crops. -- The short period of extreme heat in July 1940, followed by good rains in August, resulted in the appearance of unusually large amounts of volunteer wheat, oats, and barley. The same conditions also favored oversummering of cereal rusts and heavy infections developed on volunteer grains during the late summer and early fall. By the middle of October volunteer plants of oats and barley were heading; and such plants usually were heavily infected with stem rust. Considerable crown rust (Puccinia coronata) appeared on volunteer oats late in October but did not become so abundant as stem rust (P. graminis avenae). Both leaf rust (P. rubigo-vera tritici) and stem rust (P. graminis tritici) infec-

1/ Contribution No. 433, Department of Botany and Plant Pathology, Kansas State College.

tion were heavy on volunteer winter wheat in the eastern half of the State and leaf rust was abundant in western counties. Infection became so severe in many fields of early sown wheat in the central part of Kansas that much of the top growth was destroyed and the amount of fall pasture seriously reduced.

The absence of killing frost at the normal time favored the development of all of these rusts up to the sudden severe freeze of November 11, 1940. Extremely low temperatures at that time killed volunteer oats and barley and all rusts on those crops disappeared rapidly. Uredio-spores of stem rust collected on dead oats and barley plants in December and in January, 1941, failed to germinate. Stem rust on winter wheat declined rapidly in abundance after the freeze of November 11, but a little infection still could be found in late December. After the first of January stem rust uredia could be found only on dead leaves and the spores failed to germinate. It seems unlikely, therefore, that stem rust on wheat, barley, and oats, and crown rust on oats overwintered as far north as Manhattan, Kansas, in 1940-41.

Leaf rust of wheat also decreased in abundance after the severe freeze of November 11, 1940, but it could be found with considerable ease in nearly all fields throughout the winter. By the middle of February fresh uredia began to appear and it became clear that leaf rust was overwintering in unusually large amounts. The surprising feature of the situation was the occurrence of overwintering in the western part of the State. This was due to the mild winter, the abundance of rust in the fall, and the heavy top growth of winter wheat that provided ample protection for uredia on leaves near the ground.

Although leaf rust of wheat overwintered in Kansas in considerable abundance, cool, dry weather during April and the early part of May prevented the rapid increase of rust from overwintered infection centers and there was not an unusually large amount of leaf rust in the State until after the middle of May. However, there were severe infections of leaf rust in Oklahoma and Texas before that time and extremely heavy showers of spores from those sources occurred in Kansas during the last half of May. This, combined with frequent heavy rains, wet soil, and heavy dews, resulted in a rapid increase in infection. By June 1 leaf rust had appeared in nearly all fields in alarming proportions, and it was soon evident that Kansas was experiencing an epiphytotic of leaf rust fully as severe as that of 1938. Maximum infection was not reached so early in 1941 as in 1938, and losses, therefore, were not so heavy but it is estimated that leaf rust caused a reduction of at least 5% in the yield of the 1941 Kansas wheat crop.

The wet weather of May and June also favored the development of other rusts. Crown rust appeared on oats in the eastern half of Kansas early in June and rapidly increased to epiphytotic proportions. By June 15 crown rust infection was the heaviest the writer ever has observed in Kansas and most oats in the eastern half of the State were badly lodged as a result of a combination of heavy crown rust infection and torrential rains. The losses due to crown rust on oats undoubtedly were heavier than those caused by leaf rust on wheat.

Stem rust (Puccinia graminis) was present on wheat, oats, and barley by the middle of June but infection was late in appearance and

developed less rapidly than is usually expected, because of temperatures slightly too low for the rapid spread of those rusts. Losses were severe in some localities but were not so large or widely distributed as in 1935 and 1937 -- years of severe stem rust epiphytotics. The advent of hot weather and rapid maturity of crops shortly after June 20 prevented large late-season losses. In the case of stem rust on wheat, it was notable that Kanred had much less infection in 1941 than other hard red winter varieties. This apparently was due to the prevalence of physiologic race 17 to which Kanred is resistant. Race 17 has been increasing in prevalence in Kansas for 2 years.

Other rusts of unusual severity in Kansas in 1941 were leaf rust of rye (Puccinia rubigo-vera secalis), leaf rust of barley (P. anomala), and rust of flax (Melampsora lini). Leaf rust on rye was the heaviest the writer has ever observed, and experimental plots of Common Winter and Balbo varieties were severely damaged. Leaf rust of barley, although relatively rare in Kansas, was severe on both winter and spring barley at Manhattan. Flax rust, which likewise seldom occurs in Kansas, produced a moderate infection in experimental plots at Manhattan. Considerable infection occurred on Linota and light infection was present on Redwing. Bison had less infection than the other 2 varieties.

Another rust that seldom appears in abundance in Kansas, but was fairly abundant in 1941, was sorghum rust (Puccinia purpurea). As usual the disease did not appear until early October. Thereafter, it was abundant on the lower leaves of Atlas sorgo at Manhattan.

Rust on alfalfa (Uromyces striatus) also appeared in late summer and fall in the north central part of the State.

Several diseases of cereal crops, usually considered of minor importance in Kansas, were present in abundance in 1941. Mildew (Erysiphe graminis) was particularly severe on wheat and barley in the early spring. On wheat this disease reached the greatest severity ever observed and undoubtedly caused some reduction in yield through early defoliation of plants in lowland fields. Speckled leaf blotch (Septoria tritici) and glume blotch (S. nodorum) were abundant on winter wheat. The former was particularly severe in the southeastern one-fourth of the State and it was noted that the variety Kawvale was extremely susceptible. Many fields of Kawvale in that area were prematurely defoliated by S. tritici. Glume blotch was most severe in south-central counties and was associated with severe lodging of wheat during the wet weather of June. Yellow mosaic (virus) of wheat also appeared in considerable abundance in Saline and Dickinson counties and caused severe losses in some fields. Loose smut of wheat (Ustilago tritici) continued to be an important disease in the State in 1941, although apparently it was not so severe as in recent years. There was a larger increase in eastern counties where the susceptible variety Clarkan is increasing in acreage than in other parts of the State.

Other Diseases of Minor Importance or of Ordinary Severity in 1941 -- Many other diseases of cultivated and uncultivated plants were present in Kansas in ordinary or minor amounts. Those observed by or reported to the writer are listed below with brief comments on each.

Diseases of Cereal, Forage, and Fiber Crops

Avena sativa, oats.

Phytomonas coronafaciens, halo blight. Infection general but light, damage slight.

Ustilago avenae and U. levis, loose and covered smuts. Widely distributed in the State and severe on Kanota. This is the Fulghum type of smut. The new resistant variety Fulton bore only light infection.

Blast (cause unknown). Prevalent but not severe.

Hordeum vulgare, barley.

Erysiphe graminis, mildew. Severe on both winter and spring barley, causing some loss.

Helminthosporium sativum, spot blotch. Prevalent on spring barley at Manhattan and on winter barley in southern Kansas.

Pyrenophora teres, net blotch. Particularly severe on volunteer barley in the fall of 1940. Moderate amounts on both spring and winter barley at Manhattan in the spring of 1941.

Phytomonas translucens, bacterial blight. Very severe on some varieties of spring barley at Manhattan.

Ustilago hordei, covered smut. Especially prevalent on winter barley in southern Kansas. Some on spring barley in western Kansas.

Ustilago nuda, loose smut. Common on spring barley.

Linum usitatissimum, flax.

Fusarium lini, wilt. Traces in experimental plots and some fields in southeastern Kansas.

Sorghum vulgare, sorghum.

Bacterium andropogonis, leaf stripe. Common on some varieties of sorghum in experimental plots at Manhattan. Particularly severe on feterita.

Sphacelotheca sorghi, covered kernel smut. Common in occasional fields of untreated sorghum.

Sphacelotheca cruenta, loose kernel smut. Occasional heads observed at Manhattan.

Sorosporium reilianum, head smut. Occasional heads observed.

Sclerotium [Rhizoctonia] bataticola, charcoal rot. Fairly common in southwestern counties.

Pythium arrhenomanes, milo disease. Common on nonresistant strains of milo and milo hybrids in central and western counties.

Weakneck (cause undetermined). Reported as occurring in fields of Colby milo, and known to occur in Early Kalo, Improved Coes, Greeley, Cheyenne, Wheatland and other sorghums in northwestern Kansas shortly before maturity.

Triticum vulgare (T. aestivum), wheat.

Ophiobolus graminis, take-all. Severe in some fields in north central and northwestern counties.

Helminthosporium spp., dry land foot-rot. Fairly common in western Kansas.
Gibberella saubinetii, scab. Traces observed in extreme southeastern part of State.
Phytomonas atrofaciens, basal glume rot. Fairly prevalent in eastern Kansas. Especially severe on Kawvale.
Phytomonas translucens undulosum, black chaff. Observed in occasional fields, especially in lodged spots or lowland fields.
Tilletia levis, bunt. Scattered in occasional fields over the State. Particularly severe on Clarkan in eastern Kansas and Chiefkan in central counties.

Zea mays, field corn.
Ustilago zeae, smut. Lightly distributed wherever corn was grown. Less abundant than usual, probably due to wet weather.
Puccinia sorghi, rust. Fairly abundant in the eastern half of the State during late summer and early fall.

Diseases of Legumes

Medicago sativa, alfalfa.
Ascochyta imperfecta, black stem. Common in experimental plots at Manhattan and in fields in some localities.
Phytomonas insidiosa, bacterial wilt. Severe in many old fields.
Peronospora trifoliorum, downy mildew. Severe during wet weather of May and June in some localities. Caused considerable defoliation.

Melilotus alba, white sweet clover.
Mosaic (virus). Common on both cultivated and roadside white sweet clover.

Vigna sinensis, cowpea.
Uromyces phaseoli vignae, rust. Observed in experimental plots at Manhattan.

Diseases of Grasses

Aegilops cylindrica, goatgrass.
Puccinia graminis tritici, stem rust. Common along roadsides in south central Kansas.

Andropogon spp., bluestem.
Puccinia andropogonis, rust. Severe on *A. furcatus* and *A. scoparius* in the vicinity of Manhattan.
Sorosporium everhartii, smut. Traces observed on *A. furcatus* at Manhattan.

Bouteloua curtipendula, sideoats grama.
Puccinia boutelouae, rust. Common in grassland near Manhattan.

Bromus inermis, smooth bromegrass.
- Phytomonas coronafaciens atropurpureum, bacterial blight. Severe on leaves, peduncles and panicles of bromegrass in vicinity of Manhattan.
- Mosaic (virus). Prevalent in grassland border of cereal rust nursery at Manhattan.

Bromus japonicus, Japanese bromegrass.
- Ustilago bromivora, smut. Occasional smutted plants in wasteland and roadsides.

Buchloë dactyloides, buffalo grass.
- Puccinia kansensis, rust. Severe in experimental plantings at Manhattan in late August and September.

Dactylis glomerata, orchard grass.
- Puccinia graminis, stem rust. Fairly common on plants near cereal plots in the fall.

Digitaria sanguinalis, crabgrass.
- Piricularia grisea, leaf spot. Common on crabgrass in wasteland and roadsides.
- Ustilago rabenhorstiana, smut. Occasional occurrence noted near Manhattan.

Hordeum pusillum, little barley.
- Puccinia rubigo-vera similis, rust. Severe in eastern Kansas during June and July.

Panicum virgatum, switchgrass.
- Uromyces graminicola, rust. Severe on both wild and cultivated plants in central Kansas.
- Phyllachora graminis, black blotch. Very severe on both wild and cultivated plants in central Kansas.

Paspalum stramineum.
- Puccinia substriata, rust. Fairly common in wasteland in central Kansas, especially around McPherson.

Poa pratensis, bluegrass.
- Erysiphe sp., mildew. Common in shaded places in lawns during June.
- Puccinia rubigo-vera agropyri, rust. Fairly common in shaded spots on lawns in eastern Kansas during June.

Spartina pectinata, slough grass.
- Puccinia peridermiospora, rust. Very common and severe in vicinity of Manhattan.

Triodia flava, purpletop.
- Puccinia windsoriae, rust. Common in grassland at Manhattan during September and October.

Tripsacum dactyloides, gamagrass.

Puccinia tripsaci, rust. Collected in experimental plots at Manhattan during October and November.

Tree Diseases

Crataegus crusgalli, cockspur thorn.

Gymnosporangium sp., rust. Extremely severe on trees in ornamental plantings on Kansas State College campus, causing defoliation during late summer. The fruits on some trees were severely attacked, each fruit bearing many aecia with extremely long cylindrical peridia.

Populus sp., cottonwood.

Melampsora medusae, rust. Unusually abundant in Kansas.

Salix sp., willow.

Melampsora sp., rust. Unusually severe in Kansas.

Ulmus americana, American elm.

Gnomonia ulmea, black leaf spot. Very common in the eastern half of Kansas. Some defoliation noted at Manhattan in late summer. Occasional trees seem resistant.

Miscellaneous Diseases

Althea rosea, hollyhock.

Puccinia malvacearum, rust. This disease prevalent in eastern Kansas. Infection heavy at Manhattan on both old and seedling plants during October and November. The disease seldom has been seen here.

Ambrosia trifida, giant ragweed.

Puccinia xanthii, rust. Prevalent in north central Kansas.

Helianthus spp.

Erysiphe cichoracearum, powdery mildew. Very abundant.

Puccinia helianthi, rust. Very abundant.

Ipomoea sp., morning glory.

Albugo ipomoeae-panduranae, white rust. Common on wild blue morning glory.

Iris sp., iris.

Didymellina macrospora, leaf spot. Prevalent on most bearded iris.

Polygonum scandens, climbing false buckwheat.

Puccinia polygoni-amphibii, rust. Abundant in northeastern fourth of the State, September to November.

Xanthium spp., cocklebur.
Puccinia xanthii, rust. Abundant in the vicinity of Manhattan on X. pennsylvanicum and X. chinense.

Zinnia elegans, zinnia.
Erysiphe cichoracearum, powdery mildew. Abundant in most parts of Kansas.
Mosaic (virus). Observed at Manhattan.

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(COOPERATIVE INVESTIGATIONS BETWEEN THE DIVISION OF CEREAL CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, AND THE KANSAS AGRICULTURAL EXPERIMENT STATION).

FURTHER NOTES ON THE FUNGI OF NEVADA

John A. Stevenson and W. A. Archer

Since the publication (Plant Dis. Reporter 24: 93-103. 1940) of a list of the fungi of Nevada based on the collections of the second author a number of additional specimens from the same source have come to hand and are here recorded.

Albugo candida (Pers. ex Lév.) O. Kuntze: On Descurainia pinnata var. paradisa (Nels. & Kenn.) M.E. Peck, Hunter's Creek road, s.w. of Reno, Washoe Co.

Erysiphe cichoracearum DC.: On Cryptantha echinella Greene, Wassuk Range above Cory Canyon, Mineral Co.; Mertensia oblongifolia var. nevadensis (Nels.) Wms.,Becky Mt., White Pine Co. New hosts.

Phragmidium montivagum Arth.: On Rosa woodsii Lindl., Cory Creek, Wassuk Range, Mineral Co.

Puccinia aristidae Tracy: On Thelypodium sagittatum (Nutt.) Endl., east slope Toiyabe Range, Smoky Valley, Nye Co.

Puccinia oenotherae Vize: On Oenothera brevipes Gray, Porter's Well, Clark Co., and south of Nelson, Eldorado Canyon, Opal Mts., Clark Co.; on O. clavaeformis Torr. & Frém., Cory Creek, Wassuk Range, Mineral Co.; on O. contorta var. flexuosa (Nels.) Munz, Wassuk Range, near Big Indian Mt., Mineral Co. These are new hosts.

Puccinia palmeri Diet. & Holw.: On Penstemon sp., Cottonwood Canyon, Mt. Grant, Mineral Co. New to the State.

Puccinia thlaspeos Schub.: On Thlaspi sp., Lamoille Lake, Ruby Mts., Elko Co. New to the State.

Puccinia vagans (DC.) Arth.: On Gayophytum diffusum T. & G., Chicken Creek, west of Mountain City, Elko Co.; on G. lasiospermum Greene, Wassuk Range, above Cory Canyon, Mineral Co.; on G. nuttallii near var. abramsii Munz, Incline, Washoe Co. New to the State on the first and third host species.

Uromyces aemulus Arth.: On Allium validum S. Wats., Snow Valley Peak, south of Marlette Lake, Ormsby Co.

Uromyces intricatus Cke.: On Eriogonum sp., Cory Creek, Wassuk Range, Mineral Co.; on Eriogonum kearneyi Tidestrom, Cory Creek, Wassuk Range, Mineral Co. New to the State on the latter host species.

Uromyces punctatus Schroet.: On Astragalus artipes Gray, Tonopah-Reese River Road, Nye Co. A new host.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY AND DIVISION OF PLANT EXPLORATION AND INTRODUCTION, U. S. BUREAU OF PLANT INDUSTRY).

COMMITTEE REPORT ON RING ROT OF POTATOES IN 1941

The committee appointed by the American Potato Association for the purpose of stimulating and coordinating research on ring rot [Phytomonas sepedonica] has again made a survey to determine the extent of the occurrence of this disease in the United States in 1941. On the basis of this survey, the committee submits the following report:

Replies received from 38 States reveal that in 17 States the disease was less prevalent than a year ago, whereas 8 States reported the disease more widespread than in 1940. In one State 33% of the carload lots shipped in 1940 contained ring rot, whereas in 1941 only 6% showed the disease. Another State mentioned that during the last 2 years the losses in one county alone were $200,000, while this year, with greater care in handling the seed, the loss did not exceed $10,000. Most of the States attributed the decrease in ring rot to the campaigns that were put on during the winter through meetings and publicity on control measures; to change in seed stocks; and to the low price of certified seed in 1940, which enabled more growers to plant certified seed.

The disease is most serious in home gardens and on farms where not much attention is paid to the source of seed. Although in many cases the planting of certified seed has given satisfactory results, in some instances the results were disappointing. One State reported the distribution ofseveral carloads of certified seed potatoes that contained enough ring rot to produce from 10 to 50% plant infection. The consensus of opinion is that the outlook for control is good as long as the certifying agencies in the seed-producing States maintain rigid control.

Attention was called to the difficulty of accurate diagnosis of the disease in the field, especially after an early frost. In such cases, and in some others, the inspector will haveto rely on examination of the tubers in the bin. In order that a more complete and thorough inspection may be made it is recommended that in addition to field inspection, at least 4 25-pound random samples for each 1,000 bushels stored be examined by cutting each individual tuber. Suspected tubers should be examined under fluorescent light, or smears should be made for examination under

the microscope. Inasmuch as the tuber symptoms become more distinct later in the season, it is desirable to make the bin inspection as late in the winter as possible.

More detailed experiments on the damage caused by planting seed containing a trace of ring rot should be conducted. More information is needed on methods of disinfecting bags, crates, storage houses, and farm machinery. The educational campaign to inform the growers of the seriousness of this disease and its occurrence in non-certified potatoes should be continued.

R. W. Goss
J. G. Leach
T. P. Dykstra, Chairman
(THE COMMITTEE OF THE POTATO ASSOCIATION OF AMERICA TO COORDINATE RESEARCH ON NEW AND UNUSUAL POTATO DISEASES).

A DEFOLIATION OF TOMATOES IN INDIANA CONTROLLED BY SPRAYING WITH MANGANESE SULFATE

H. Rex Thomas

A severe defoliation of the tomato plant distinct from defoliation caused by Alternaria solani (Ell. & Mart.) Jones & Grout, Septoria lycopersici Speg., Phytomonas vesicatoria (Doidge) Bergey et al., or by a deficiency of nitrogen, phosphorus or potassium, was observed in Indiana during the summer of 1940 and was found again in 1941. Affected plants were first noticed in Allen County in the northeastern part of Indiana, but have since been found in Adams, Tippecanoe, Clinton, and Marion Counties.

The first observable symptoms have been a chlorosis and inward rolling of the young leaflets closely followed by a necrotic spotting. The necrotic areas become progressively larger, coalesce, and finally cause the leaflets to wither and die. Severely affected plants have only a tuft of leaves at the tips of the stems, the lower leaves having died. The affected plants are stunted and the foliage has a light green color which enables one to locate areas from the edge of the field.

With the exception of one 12-acre field which was uniformly affected, the diseased plants have been confined to low areas in the field where the soil is compact and poorly aerated, frequently referred to as a "gumbo." The soil in the northeastern part of the State where the trouble was first found is classified as a Paulding clay.

In the other sections, Brookston and Crosby are the prevalent soil types where the deficiency has appeared. The pH of the soil in affected areas ranged from 7 to 7.5, in unaffected areas from 5.7 to 6.4. In 1940, the season was extremely dry and it was uncertain whether the drought might not have been partly responsible for the defoliation. However, the same symptoms were found in 1941, when in June and July the rainfall was above normal.

In 1940, solutions of manganese sulfate, ferric sulfate, borax, or zinc sulfate were sprayed on the leaves of affected plants, or a dilute

solution of sulfuric acid was added to the soil. Only those plants sprayed with manganese sulfate or growing on the acid-treated soil produced new growth free of necrotic spotting. In 1941 affected plants were sprayed late with solutions of manganese sulfate and ferric sulfate but no positive recovery was obtained. The lateness of these treatments in the growing season may explain the failure of the plants to respond. A fieldman for a tomato cannery with acreage located in the northeastern part of the State sprayed affected plants with manganese sulfate early in the 1941 season and reported rapid recovery. As yet, attempts to reproduce the symptoms in the greenhouse on plants grown in soil taken from affected areas in the field have been unsuccessful. Apparently, disturbance of the soil texture, or environmental conditions, may effect the availability of the manganese to the plant.

(CONDUCTED AS A PHASE OF COOPERATIVE INVESTIGATIONS BETWEEN THE DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, AND THE DEPARTMENT OF BOTANY, INDIANA AGRICULTURAL EXPERIMENT STATION).

DITYLENCHUS DIPSACI ON TRIFOLIUM PRATENSE IN NEW YORK STATE

R. W. Henderson

The stem or bulb nematode, Ditylenchus dipsaci, appeared in destructive numbers in red clover plants (Trifolium pratense) in the greenhouses of the Plant Breeding Department, Cornell University, at Ithaca, New York, during the winter of 1941-42.

The organisms were introduced into the greenhouse in September and November, in plants selected from varietal plots seeded in the spring of 1939. They spread to a large number of the selections, which were being propagated vegetatively in flats of sterilized sand. Their presence was first detected in January 1942. Specimens were submitted by A. G. Newhall of the Plant Pathology Department to G. Steiner and B. G. Chitwood of the United States Department of Agriculture, who identified them as Ditylenchus dipsaci (Kuhn 1858) Filipjev 1936.

The nematodes were not observed in the field from which the plants were taken. However, their presence in the field can be safely assumed since plants potted in steam-sterilized soil developed typical swellings on leaves, leaf petioles, and crowns. Examination of these swellings revealed the presence of eggs, larvae, and adults. Information concerning the source of the nemas, how long they have been present in the field, and to what extent they have become established, is lacking. The natural occurrence of this strain in red clover fields in New York is believed not to have been reported previously.

Since these organisms have rendered useless several hundred plant selections chosen for breeding purposes, a method for destroying the nemas without destroying the entire plant is desired. Preliminary attempts to accomplish this by treating the plants with hot water were unsuccessful. The possibility of obtaining nematode-free cuttings from certain portions of the plants is being investigated.

Seeds of several crop plants were planted in flats of steam-sterilized soil and watered with a suspension of eggs, larvae, and adults. Shortly after emergence typical swellings were observed on seedlings of the following plants: red clover, _Trifolium pratense_; white and Ladino clovers, _T. repens_; alsike clover, _T. hybridum_; strawberry clover, _T. fragiferum_; _T. involucratum_; soy bean, _Soja max_; field pea, _Pisum arvense_; alfalfa, _Medicago sativa_; and onion, _Allium cepa_.

Examination of the seedlings after 6 weeks revealed the presence of eggs, larvae, and adults in the seedlings of soy bean, field pea, and red clover. No stages of the organism could be recovered in 6-week old onion seedlings exhibiting pronounced symptoms. These preliminary experiments further indicated that this nema population was not adapted to wheat, _Triticum vulgare_; barley, _Hordeum vulgare_; oats, _Avena sativa_; rye, _Secale cereale_; dandelion, _Taraxacum officinalis_; and buckhorn plantain, _Plantago lanceolata_.

(CORNELL UNIVERSITY, ITHACA, NEW YORK).

REPORTS ON THE DEVELOPMENT OF APPLE SCAB

NEW YORK (reports from State College of Agriculture Weekly News Letter for dates given):

Western New York (April 27)

Orleans County - McIntosh sample, April 17. No ascospore discharge in 6 hours and very light in 20 hours. Perithecia: 12% pre-ascus; 50% ascus; 2% with hyaline spores; 4% with less than 10% of spores colored; 12% with 10 to 50% of spores colored; 20% with over 50% of ascospores colored.
Monroe County - McIntosh sample 2 miles from lake April 18. Slight ascospore discharge in 5 hours, moderate in 20 hours. Perithecia: 3% pre-ascus; 41% ascus; 11% hyaline; 13% less than 10% colored spores; 22% with 25 to 50% colored spores; 10% with more than half the ascospores colored.
Niagara County - McIntosh sample "midway from Lake Zone to earliest" gathered April 16 (early green tip). Too few perithecia for an accurate count. No colored spores noted but most perithecia contained well developed asci. No shoot in 3 hours. McIntosh sample from the Lake Zone, too few perithecia for count. No shoot in 3 hours. - W.D. Mills.

Wayne County - The apple scab fungus has developed rapidly during the warm weather of the past week. Variation in the development of the fungus in individual leaves is very marked. Few or no spores are colored in some leaves while others have almost 100% perithecia filled with brown spores.

In a McIntosh sample collected April 25 near Lyons leaves bearing large lesions discharged heavily during 4 hours in moist chamber, and 50 to 75 spores per low powered field of the microscope could be easily found on the slides.

A McIntosh sample collected April 26 near Sodus showed about the same development of the perithecia as above but the leaves were less severely scabbed and spore discharges were lighter. - F. H. Lewis.

Hudson Valley (April 20)

Apple scab perithecial development in the Hudson Valley seems to vary considerably from one location to another this year. Leaves of McIntosh collected during the week, from Rock City in Dutchess County and Warwick in Orange County, showed practically no perithecia with colored spores whereas a collection from Ohioville in Ulster County showed 14% of the perithecia with more than half of the spores colored and ready to discharge. - D. H. Palmiter, Poughkeepsie.

APPLE SCAB SPORE DISCHARGE DELAYED IN MARYLAND: Overwintered apple leaves collected late in March under apple trees in commercial orchards, examined in the orchard and later brought to the laboratory for further study, showed an abundance of small perithecia in all orchards. About April 2, following several rains and a heavy snow, the apple scab fungus began to develop rapidly, and scab spores were predicted, under normal weather conditions of one or more rains each week, to be shooting about April 15 on the Eastern Shore and Southern Maryland; about April 18 in Central Maryland, and about April 27 in Western Maryland. During the past 10 days there have been no rains or heavy dews and the scab fungus is very slow in developing.

At the present time scab perithecia are still small and the ascospores mostly undeveloped. The contents are still granular with some asci developing into the "banana bunch" in more advanced perithecia. Up to this time I have found no fully mature or ripe ascospores from leaves collected under orchard conditions. (E. A. Walker, April 28. University of Maryland).

A SUCCESSFUL SPRAY FOR BLUE MOLD OF TOBACCO

P. J. Anderson

Although fumigation with benzol or paradichlorobenzene when properly applied will give excellent control of blue mold [=downy mildew, *Peronospora tabacina*], the fumigation method has certain drawbacks. The seed beds must be very tightly constructed to prevent escape of the gas; but many seed beds in the Connecticut Valley are not so constructed and as a result the growers waste their time and money without getting control. The paradichlorobenzene method is also quite dependent on temperature and does not give sufficient evaporation at low temperatures. Benzol is inflammable and also, if splashed on the leaves, causes dead spots. Both substances must be applied at night and this causes dissatisfaction with the labor.

There is a distinct need for a simple but effective spray material. The writer has tested many materials during the last 4 years but up until 6 months ago has failed to find a satisfactory one.

Experiments on 4 crops of plants during the last winter in the greenhouse and also in the seed beds this spring have now demonstrated that ferric dimethyl dithiocarbamate will give 95 to 100% control. Best

control was obtained with a dilution of 1-1/2 to 2 grams of the material in a liter of water with the addition of an equal amount of lime. The plants were sprayed twice a week. Possibly further experiments will show that longer intervals or different dosages are equally good. During some of the tests there was a little leaf injury (chlorotic spots) from the spray, but this was never serious. Equally good control was obtained with sodium dimethyl dithiocarbamate, but this injured the plants some and was therefore not used in further trials.

This material is now being introduced by DuPont under the trade name of "Fermate."
(CONNECTICUT AGRICULTURAL EXPERIMENT STATION, TOBACCO AND VEGETABLE SUB-STATION).

NOTES ON PLANT DISEASE CONTROL

"THIURAM DISULFIDE FOR TURF AND FOR TREATING SEEDS": In The Nursery Disease Notes of the New Jersey Agricultural Experiment Station (Vol. 14, No. 10, April 1942) P. P. Pirone reports experimental results indicating that tetramethyl thiuram disulfide (T.M.T.D.) will be a valuable substitute for the standard mercury compounds, red copper oxide, and formaldehyde, all of which are likely to be unavailable in the near future.

THE PLANT DISEASE REPORTER

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BUREAU OF PLANT INDUSTRY, UNITED STATES DEPARTMENT OF AGRICULTURE

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

TENTATIVE PROGRAM
AMERICAN PHYTOPATHOLOGICAL SOCIETY
SUMMER MEETING
SECOR HOTEL, TOLEDO, OHIO
JUNE 25-26, 1942

In the rapidly changing times participation in war emergency meetings should be encouraged. The summer meeting of the American Phytopathological Society is definitely a war emergency meeting. It will deal with "The role of plant pathologists in a war emergency program." Emphasis will be placed on activities of the Society's "War Emergency Committee." Everyone will be intensely interested in the progress made by this committee, and in assisting in formulating future activities.

Attend the summer meeting and be informed.

June 25

10:00 a.m. The role of plant pathologists in the war program. -- Summarized by the War Emergency Committee - E. C. Stakman, Chairman.

1:30 p.m. Round table discussion on spray material and spray equipment priorities and substitute materials. (This will include reports by members of the Society and representatives of industry).-- J. G. Horsfall, Chairman.

3:30 p.m. Demonstration of techniques used in determining physical properties of dust mixtures and performance of dusting equipment. -- Co-chairman, J. D. Wilson, Ohio Experiment Station, and Frank Irons, U.S.D.A., Engineering Laboratory.

7:30 p.m. Opportunity for regional, or special committee meetings.

June 26

10:00 a.m. Discussion on extension, research and teaching policies during present emergency. -- Leaders: H. P. Barss, O. D. Burke, N.E. Stevens.

1:30 p.m. Summary of program, policies and future activities of the War Emergency Committee. -- (Members of the executive committee in charge.

Opportunity will arise in various sessions for a discussion of quarantines, the draft, disease surveys, and other subjects which the War Emergency Committee, or members desire.

CHECK LIST REVISION

Freeman Weiss

ROSA (ROSACEAE)

ROSA spp., CULTIVATED ROSES.* Upright or trailing shrubs, of which the principal garden types are (1) "OLD ROSES", including derivatives of R. gallica L., French or Provence rose, R. centifolia L., cabbage and moss roses, R. damascena Mill., damask rose, R. moschata Herrm., musk rose, and R. cinnamomea L., cinnamon rose; of Europe and W. Asia; cult. Zones IV to VI. (2) BRIER ROSES, as R. foetida Herrm., Austrian Brier and Persian Yellow roses, R. hugonis Hemsl., Hugo rose, R. spinosissima L., Scotch rose; of Europe and W. Asia; cult. Zones IV & V. (3) SWEETBRIER ROSES as R. eglanteria L., eglantine, of Europe; cult. Zone IV and widely naturalized in the U.S.; also crosses with R. foetida producing Penzance hybrids. (4) PERPETUAL BRIER ROSES, as R. rugosa Thunb. and hybrids with various other groups; of E. Asia; cult. Zones II and III. (5) TEA and CHINA ROSES, as R. odorata Sweet, tea rose, R. chinensis Jacq., China and Bengal roses; of China; cult. Zone VII. (6) HYBRID PERPETUAL or REMONTANT ROSES (X R. BORBONIANA), including X R. noisettiana Thory, Noisette and Manetti roses, X R. borboniana Desp., Bourbon rose, which are hybrids of R. chinensis and R. centifolia, R. damascena, R. moschata and R. gallica; cult. Zone IV. (7) HYBRID TEA ROSES (R. DILECTA Rehd.), derived chiefly from crosses between hybrid perpetuals and R. odorata; and also crosses between these and R. foetida producing the Pernetiana hybrids; cult. Zone V. (8) MULTIFLORA ROSES (R. MULTIFLORA Thunb.), including garden roses as Crimson Rambler, and understock roses; E. Asia; cult. Zone V. (9) POLYANTHA (Floribunda) and BABY RAMBLER roses, derived from crosses between R. multiflora, R. chinensis and hybrid teas. (10) WICHURAIANA HYBRIDS, derived from R. wichuraiana Crép., Memorial rose, crossed with R. multiflora and R. laevigata Michx., Cherokee rose; including most of the large-flowered climbers; cult. Zone V. (11) SETIGERA HYBRIDS, e.g., American Pillar, derived from the native R. setigera Michx., prairie rose, crossed with various other groups; cult. Zone IV. (12) EVERGREEN ROSES, including several types, as R. banksiae Ait., Banks' rose, R. bracteata Wendl., McCartney rose (var. Mermaid), and R. laevigata Michx., Cherokee rose; all of E. Asia; cult. Zone VII.

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* Because of the many and ambiguous species composing the horticultural roses and to some extent the native rose flora, species differentiation within these two groups is not attempted here, but the cultivated roses, which are predominantly derived from Asiatic and European species are segregated from those indigenous to our range or naturalized here.

CULTIVATED ROSES -- continued

Alternaria sp. (usually reported as A. brassicae (Berk.) Sacc.,= A. circinans (Berk. & Curt.) Bolle), on leaves, ? leaf spot. Va. to Ala. & Texas, occasionally elsewhere.

Armillaria mellea Vahl ex Fr., root rot. Calif., Miss., Oregon, Texas, Wash.

Botryosphaeria ribis var. chromogena Shear et al., canker, dieback. Ala., Md., Texas, Va.

Botrytis cinerea Pers., bud & twig blight, sometimes storage mold. Cosmopolitan.

Cercospora puderi B.H.Davis, leaf spot. Fla., Ga.

C. rosicola Pass. Conidial stage of Mycosphaerella rosicola.

Chalaropsis thielavioides Peyronel, black mold, (Manetti mold") of grafts. Ill., N.Y., Pa. on understocks from Oregon & Wash.

Cladosporium sp. and C. fuscum Lk. ex Fr., leaf & bud mold. Alaska, Md., Minn., Miss., Texas.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.

Coniosporium limoniiforme Syd., on leaves. Utah.

Coniothyrium fuckelii Sacc. Conidial stage of Leptosphaeria coniothyrium.

C. rosarum Cke. & Harkn. (probably = C. fuckelii), graft canker. Calif., Iowa, Mass., Minn., N.J., Pa.

C. wernsdorffiae Laubert, brand canker. Colo., Ind., Minn., Miss., N.Y., Pa., Texas.

Corticium stevensii Burt, thread blight. Fla., La.

Coryneum microstictum Berk. & Br. Conidial stage of Griphosphaeria corticola. (The var. foliae Dearn. & Overh. is reported on leaves in N.Y.).

Cryptosporella umbrina (Jenkins) Jenkins & Wehmeyer (Diaporthe umbrina Jenkins) brown canker of canes, also on buds & flowers. Mass. to Fla., Texas, Nebr. & Mich.; Calif., Idaho.

Cryptosporium minimum Laubert, canker. Oregon, Pa.

Cucurbitaria rosae Wint. & Sacc., on canes. N. Mex., N.Y.

Cuscuta indecora Choisy and C. paradoxa Raf., dodder. Texas, Fla.

Cylindrosporium scoparium Morgan, basal canker (crown canker). Mass. to Ga., Texas & Ill.

Cytospora sp., dieback. Ky., Pa., Va., Wash.

Dermatea rosae (Sacc.) Rehm, on twigs. N.Dak.

Diaporthe eres Nits. (Phomopsis sp.), on canes, twigs and buds. Calif., Ga., La., Md., Mo., N.Mex.

Didymella nigrificans Karst., on canes. N.Mex.

D. sepincoliformis (DeNot.) Sacc., dieback. Md.

Diplocarpon rosae Wolf (Actinonema rosae (Lib.) Fr.), blackspot. General.

Diplodia spp., canker, dieback (probably secondary). N.J. to Fla., Texas & Nebr. D. natalensis Pole-Evans, Texas; Conidial stage of Physalospora spp.

Discosia artocreas Tode ex Fr., on buds & stems, probably saprophytic. La., Miss., Mo., Ohio.

Dothiorella sp., blossom blight, also on twigs & canes. La., Va.

CULTIVATED ROSES -- continued.

Fusarium spp., root rot. Occasional, chiefly in the South; not shown pathogenic.

Gloeosporium spp., twig & cane blight. Widespread. In part G. rosaecola Dearn. & Barth. or G. rosarum (Pass.) Grove, synonyms of Sphaceloma rosarum; in part the conidial stage of the following.

Glomerella cingulata (Ston.) Spauld. & Schrenk, dieback. Md., N.J., Va.

Griphosphaeria corticola (Fckl.) Höhn. (Coryneum microstictum Berk. & Br.), canker, dieback. N.H. to Ala., N.Dak., Pacific Northwest.

Guignardia spinicola (Ell. & Ev.) Lindau, on thorns. Pa.

Heterodera marioni (Cornu) Goodey, root knot. Conn. to Fla.; Mich. & Nebr.; Texas to Calif. (Reports from North pertain mostly to greenhouse roses).

Leptosphaeria coniothyrium (Fckl.) Sacc. (Coniothyrium fuckelii Sacc.), graft canker, common canker, sometimes leaf spot. General.

(Leptothyrium rosarum Cke.): Pezizella oenotherae.

Macrophoma sp., ? dieback. Texas, Va. Conidial stage of Physalospora sp.

Monochaetia compta (Sacc.) Allesch. (= M. depazeoides (Otth.) Allesch.?), leaf spot. Alaska, Iowa, Kans., Md.

Mycosphaerella rosicola B.H. Davis (Cercospora rosicola Pass.), leaf spot. General except possibly the far South.

M. rosigena (Ell. & Ev.) Lindau, leaf spot. La., Md., N.J.; N.Y.; Canal Zone, P.R. Possibly confused with the preceding and not certainly distinct; apparently more southern in distribution.

Myxosporium rosae Fckl. Reported occurrences are the conidial stage of Gryptosporella umbrina or of Diaporthe eres.

Nectria cinnabarina Tode ex Fr., coral spot on twigs & canes. Mass. to Va.; Wash., Alaska.

Peronospora sparsa Berk., downy mildew (chiefly on cuttings under glass). Me. to Fla. & Iowa; Calif.

Pestalotia spp., associated with leaf, stem & bud necrosis but probably secondary; not critically identified. P. compacta Berk. & Curt., Fla.; P. discosioides Ell. & Ev., Del., Mich.; P. rosae Westend., N.J. to Ala. & Texas; P. suffocata Ell. & Ev., Pa.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves & stems. N.J. to Fla., Texas & Mich.

Phoma spp., on thorns & twigs. Widespread. Probably Phomopsis.

Phomopsis spp., on thorns, bark & buds; associated with canker & dieback, but probably secondary. Widespread. In part Diaporthe eres Nits., as P. incarcerata (Sacc.) Höhn.

Phragmidium americanum (Pk.) Diet., rust (O,I,II,III) on leaves of cult. and native roses. Me. to N.Car., Texas & N.Dak.

P. disciflorum (Tode) J.F. James, rust (O,I) on leaves and stems, II & III on leaves, chiefly of cult. roses of the R. gallica group. Eastern States to Rocky Mts., Pacific Coast, T.H.

CULTIVATED ROSES -- continued.

Phragmidium speciosum (Fr.) Cke., rust O & I on leaves & stems, III on stems of cult. and native roses. Throughout the U.S., except the far South.

P. subcorticinum (Schrank) Wint., rust O & I on stems, II & III on leaves. Commonly on cultivated roses of the brier and sweet-brier groups. Reported from all the States except the Southeast and Southwest, and also Alaska, but Arthur (Manual of Rusts) gives the distribution as "northern U.S. east of the Rocky Mts."

Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.

Phyllosticta spp., on lvs. P. erratica Ell. & Ev., Ala.; P. rosae Desm., widespread; P. rosicola Massal, N.J. Probably spermatial stages of Mycosphaerella.

(P. rosarum Pass.): Sphaceloma rosarum

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Texas.

Physalospora fusca N.E. Stevens, on canes. Fla., Ga.

P. obtusa (Schw.) Cke., cane blight. Conn. to Ala., Texas & Kans.

P. rhodina (Berk. & Curt.) Cke., on canes. Fla., N.Car.

Phytomonas rhizogenes Riker et al., hairy root. Pa., Texas.

P. syringae (Van Hall) Bergey et al., shoot blight. Ark.

P. tumefaciens (EFS. & Town.) Bergey et al., crown gall, stem gall. General.

Pilobolus sp., on leaves of greenhouse roses; superficial but unsightly, the sporangia discharged from coprophilus fungi. Occasional.

(Pleosphaerulina corticola (Fckl.) Rehm): Griphosphaeria corticola.

Pratylenchus pratensis (DeMan) Filip., in roots. Ohio.

Ramularia macrospora Fresen., root & collar rot. Md.

Sclerotium rolfsii Sacc., Southern blight. Fla., Kans., Texas.

Septoria rosae Desm., leaf spot. Miss., N.J., S.Car., P.R.

Sphaceloma rosarum (Pass.) Jenkins, anthracnose. Me. to Fla., Texas & Kans.; Pacific Coast States.

(Sphaeropsis rosarum Cke. & Ell.): Physalospora obtusa.

Sphaerotheca humuli (DC.) Burr. and S. pannosa (Wallr.) Lév., powdery mildew. General. Following Salmon (Monograph of the Erysiphaceae) rose mildew has been widely attributed in the U.S. to the first named sp., especially on wild roses and on the foliage of greenhouse roses as distinguished from that more prevalent on the buds & shoots of garden roses. Other studies indicate that greenhouse rose mildew is caused in the U.S. as in Europe by S. pannosa var. rosae Woronichine. Both S. humuli and S. pannosa have been authentically identified on roses in the perithecial stage but most collections include only the conidial stage in which the two are hardly distinguishable; this may account for conflicting reports on varietal resistance.

Valsa ambiens Pers. ex Fr., on dead canes. Cosmopolitan.

Verticillium sp., wilt. Ark., N.Y.

V. albo-atrum Reinke & Berth. Calif., N.J., Ill.

Chlorosis, mineral deficiency due to alkaline soil. Nebr., Texas.

CULTIVATED ROSES -- continued.

Crinkle, -- virosis-like but not shown transmissible, occurring especially in var. Manetti and other understock roses, sometimes in garden roses. Pacific Coast States, Texas; also Md., N.Y., Pa. & Va.

Mosaic (infectious chlorsis), Rosa virus 1 Brierley ex Smith (Marmor rosae Holmes). Chiefly on greenhouse roses in Eastern and Central States, sometimes on garden roses; identified but infrequent on understock and other roses in Pacific Coast States. A yellow variety, Rosa virus 2 Brierley ex Smith, is reported in Md., N.Y., Pa.Ill.,Va.,and possibly (as rose viruses 2 and 3 Thomas & Massey) also in Calif. Rosa spp. have been shown experimentally susceptible to the viruses of apple mosaic and Winter's peach mosaic.

Pedicel necrosis (collapse of flower stem), cause unknown. N.Y. to Md. & Ohio.

Root gall (in R. odorata), cause unknown, probably non-parasitic. Calif., Md.

Rough bark, cause unknown, possibly virus. Calif.

Speckle, -- chlorotic flecks in leaves, cause unknown; not transmitted by grafting. Occuring especially on R. multiflora, and sometimes other roses, in Md., N.J., N.Y., Pa., Texas, Va.

Streak (? veinal chlorosis), Rosa virus 4 Brierley ex Smith (Marmor veneniferum Holmes). On various kinds of roses in Md., N.J., N.Y., Texas, Va.

ROSA spp., native to the U.S. and its possessions. Of about 15 native spp. of roses, only R. setigera Michx, prairie rose, has been used extensively in horticulture but forms of the following also are cultivated: in Zone III, R. nitida Willd., R. nitida Willd., R. suffulta Greene, R. virginiana Mill., R. woodsii Lindl.; in Zone IV, R. acicularis Lindl., R. arkansana Porter, R. carolina L.; in Zone V, R. californica Cham. & Schlecht., R. foliolosa Nutt., R. nutkana Presl. Several spp. are important in erosion control or furnish forage and wild life food. The following introduced spp. have become naturalized: R. bracteata and R. laevigata in the South; R. canina, R. cinnamomea, R. eglanteria, R. gallica, R. micrantha and R. spinosissima in the Eastern States; R. eglanteria in the Pacific Northwest. In the following list, the reported occurrences apply to several but not necessarily all of these spp. unless a more restricted distribution is stated.

Botryosphaeria ribis (Tode ex Fr.) Gross.& Dug. and var. chromogena Shear et al., canker, dieback. Md., Va.

Cercospora sp., leaf spot. Mich.

(C. rosicola Pass.): Mycosphaerella rosicola.

Cryptosporella umbrina (Jenkins) Wehmeyer & Jenkins, brown canker. Md., Mich., N.J., N.Y., Va., W.Va.

ROSA spp., native -- continued.
Diatrype tristicha DeNot. (Valseutypella tristicha (DeNot.) Höhn.), on dead stems. Calif., N.D.
Diplocarpon rosae Wolf, black spot. Widespread, but infrequent.
Diplodia sarmentorum Fr., on branches. Calif.
Griphosphaeria corticola (Fckl.) Höhn., canker, dieback. N.Dak.
Leptosphaeria coniothyrium (Fckl.) Sacc., canker, dieback. Va.
Mycosphaerella rosicola B.H.Davis, leaf spot. Ga. & N.Car. to Kans. & Wis.; Wash.
Nectria cinnabarina Tode ex Fr., coral spot, dieback. Alaska, N.Y.
Peronospora sparsa Berk., downy mildew. Calif., Texas.
Phoma sepincola (Kickx) Sacc., on twigs. Nebr.
Phragmidium americanum (Pk.) Diet., rust (0,I,II,III). Eastern States to Mont. & Texas.
P. disciflorum (Tode) J.F.James, rust (0,I,II,III). Ill., Kans., Wis. (Usually on cult. roses, occurrence on native spp. not critically confirmed).
P. montivagum Arth., rust (0,I,II,III). S. Dak. to N.Mex., Ariz. & Wash.
P. rosae-acicularis Liro, rust (0,I,II,III). Mich. to Colo. & Idaho; Alaska.
P. rosae-arkansanae Diet., rust (0,I,II,III). Ill. to Colo. & Wyo.; Calif.
P. rosae-californicae Diet., rust (0,I,II,III). Ariz., Calif., Mont. Oregon.
P. rosicola (Ell. & Ev.) Arth., rust (III). Colo., Mont., Nebr.
P. speciosum (Fr.) Cke., rust (0,I,III). On R. acicularis. Eastern States to Rocky Mts.
P. subcorticinum (Schrank) Wint., rust (0,I,II,III). Colo., Me., Minn., Mont.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.
Phyllosticta rosae Desm., leaf spot. N.Y. to Fla. & Ind.; Colo.
(P. rosarum Pass.): Sphaceloma rosarum.
Physalospora obtusa (Schw.) Cke., on canes. Md., N.Dak., Va.
Sphaceloma rosarum (Pass.) Jenkins, anthracnose. N.Y. to Mich. & Texas Oregon.
Sphaeronemella rosae Ell. & Ev., on canes & twigs. Md., N.J., Va.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Conn. to Va., Texas, Calif. & Wash. According to Salmon, the most common sp. on roses in the U.S.
S. pannosa (Wallr.) Lév., powdery mildew. General. According to Salmon, S. pannosa is infrequent among American collections, but this name is widely used in reports.
Valsa ambiens Pers. ex Fr., on dead stems. N.Y., N.Dak.
Crinkle, cause unknown. On R. gymnocarpa and R. nutkana. Oregon, Wash.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

BLUEBERRY STUNT, A VIRUS DISEASE

R. B. Wilcox

A disease of the swamp or high-bush blueberry (*Vaccinium australe* Small (*V. corymbosum* L.)), locally known as "stunt", has been under investigation in New Jersey for several years. Microscopical examination and attempts at isolation have failed to indicate the presence of a parasitic organism. The trouble has not been corrected by the use of commercial fertilizers or by applications of various chemicals to the soil or to the foliage.

Cuttings made from "stunted" wood have not rooted, and buds taken from obviously stunted canes, when set in healthy shoots, died without transmitting the disease. In early September, 1940, however, buds were taken from apparently healthy canes of slightly diseased bushes and inserted into young canes of healthy plants. These produced shoots the following spring that showed unmistakable symptoms of stunt by July, and in another month the disease had appeared on non-budded shoots from the crowns of the stock plants. These non-budded shoots plainly showed the foliage and branching characters of stunt before dropping their leaves in the fall.

This development of the disease in shoots originating from buds from diseased plants and the spread to adjacent shoots, the apparent absence of a pathogenic organism, the failure of chemicals to correct the condition, and the character of the natural spread in the field, seem to constitute adequate evidence that the malady is a virosis.

The general effect of the stunt disease is a reduction in the length and vigor of new growth, a moderate stimulation of branching, and the production of small unmarketable fruit. Affected bushes when normally pruned make very few basal shoots. It is the common practice of blueberry growers to prune back severely, even to the crown, all weak or unproductive bushes, in an attempt to force vigorous growth for renewal. When bushes infected with this disease are given such severe treatment they respond by forming many weak shoots that by midsummer show a tendency toward cessation of terminal growth and develop branches near the tip at sharp angles with the stem. This stunted condition or appearance of the bushes has given rise to the name "stunt." On recently infected vigorous bushes the new shoots may attain a height of 3 feet, but in advanced stages of the disease they will not exceed half that height and sometimes will grow only a few inches. Although individual shoots of infected bushes may die during their first winter, the bush may live for several years.

Usually from 2 to 5 of the youngest leaves of an infected basal shoot are pale green or yellowish at the tip and on the margins (especially of the distal half of the leaf), seldom between the veins. This apical-marginal pallor may be so indistinct as easily to escape notice, but it is one of the earliest and most constant signs of the disease. Less often the young leaves appear almost completely etiolated. There is no mottling of the foliage. All leaves are reduced in size to some degree, and the internodes shortened.

Symptoms on mature fruiting canes are somewhat different. Few large branches are produced, but there are likely to be many fruiting laterals, short, slender, and with crowded leaves, giving the plant a bushy appearance. Fruit buds form except in the most advanced cases, and develop in the spring into flowers and berries; the latter color normally but remain very small, have a characteristic, unpleasant taste, and do not separate easily from the stems; these berries may hang on the bush until after the leaves have fallen in autumn. On stunted bushes of most varieties, the foliage of mature canes by midsummer takes on a brilliant, orange-red coloration that persists until the leaves drop. The color is similar to that caused by other conditions, such as wet soil or deficiency of magnesium, but its location in the leaf is distinctive. It appears in 2 longitudinal, indefinitely limited, bands or stripes, at or just inside the margin, with the central portion of the leaf (including the base and usually the tip) remaining green. In advanced cases of the disease the leaf margins may become necrotic and brown, with the 2 parallel red stripes moved inward toward the midrib. This coloration is strikingly conspicuous until fall frosts give a general reddish color to the foliage. There is at least one susceptible variety, the Rubel, on which the red color characteristic of stunt does not develop.

There seem to be varietal differences in susceptibility to stunt, but whether these are real or are due to partial or complete suppression of symptoms has not been determined. The disease has not been recognized on the Rancocas variety. On Rubel, the usual symptoms appear except for the red color on the foliage of mature canes. The disease has been found most commonly on Cabot, Concord, Pioneer, Rubel, and Scammell, but these are not necessarily the most susceptible. Scattered cases have been found on a number of other commercial varieties, and on certain unnamed hybrids. The reaction of several recently introduced varieties to infection is not known.

The disease was first observed on old bushes of unnamed hybrids in a trial field at Whitesbog, New Jersey, and later appeared in nearby rows of the Concord variety. Several miles distant, it developed on numerous plants in another field of unnamed hybrids, where the bushes were 8 years old and very vigorous; this is the youngest field now known to show heavy infection. New Jersey plantings in which stunt has become abundant number less than a half dozen, but scattered cases have been found in many other fields in the State. Stunt has been found in considerable amount in 2 fields in North Carolina, and to a slight extent in a third planting. It has been identified on bushes sent from New York State, and may occur also in other regions where the high-bush blueberry is cultivated.

The means of dissemination of the disease in the field is not known. Attempts to transmit it by pruning shears or other mechanical devices have failed, and there is no evidence that field transmission ever occurs in this way. It is suspected that some insect is the vector, but none has yet been identified. In a field in which some plants are known to have been diseased for years, new cases of stunt have developed at times on bushes near infected ones, most commonly in the immediate vicinity, and less frequently with increase in distance. The occasional lack of spread from known diseased bushes over a period of several years, and the slow rate of advancement in most fields, indicates either that a vector is not commonly present or that other conditions inhibit transmission of the viru

The disease has not been recognized on nursery stock. It has been found on very few plants that have been in the field for as short a time as 2 years, and has appeared mostly on mature bushes. Nevertheless, in spite of the difficulty of rooting cuttings from diseased wood, it seems probable that the disease may be carried in cuttings having incipient infection, and that the expression of symptoms in the young plants is usually delayed. It should be added, however, that the very early symptoms of stunt were not definitely known until the disease was observed in the budded plants in 1941, and that increased knowledge of these early symptoms may aid in identifying the disease in younger plants and even in nursery stock.

Observation of the development of the disease in the budded plants made it possible for the first time to distinguish clearly between this and other blueberry troubles which have heretofore been included under the general name of stunt. Certain of these other troubles may prove to be due to other viruses; some are perhaps closely related to the disease under discussion; and one or two are probably genetic in character. Symptoms suggestive of stunt, but distinguishable from it, have also been induced by environmental conditions, especially by very poor drainage or actual flooding of parts of fields.

Plants infected with stunt may live for several years, but in many cases they have been removed from commercial fields, usually after having been severely headed back. Bushes lacking in strength and productiveness, though growing in an apparently favorable environment, can sometimes be invigorated by heavy pruning; if, however, the weakness is due to stunt infection, the heading-back will bring out unmistakable symptoms of the disease in young shoots. It is now recommended that, as soon as possible after a bush is found to be affected with stunt, it be pulled up and removed from the field. This eradication must be one of the first steps in control, and should become progressively more effective with increasing knowledge of the early symptoms of the disease. Plants growing in fields in which stunt is known to occur should be avoided as sources of propagating material.

(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY).

A SUGGESTED BASIS FOR THE PREDICTION OF WHEAT LEAF-RUST EPIPHYTOTICS

K. Starr Chester

The general features of the phenological background favoring epiphytotics of wheat leaf rust (<u>Puccinia triticina</u> Eriks.) [<u>P. rubigo-vera tritici</u> (Eriks. & Henn.) Carl.] are well known; the details of this requisite background are intricate and elusive. In this case, as with other plant diseases, there are doubtless many concomitant circumstances that have nothing essential to do with the disease and that obscure the group of necessary antecedent circumstances without which serious rust outbreaks cannot occur. Many of the factors necessary for epiphytotic development of leaf rust are present in all years: virulent primary in-

oculum, large acreages of susceptible wheat, a level of soil fertility permitting the development of susceptible types of leaf tissues, development of the crop at a season of the year favorable to rust activity, strong winds to effect the dispersal of rust spores. Indeed, the only factors that fluctuate in such a way as to produce or inhibit leaf rust development over large wheat areas are temperature and moisture. But here we are dealing with limitless variations and combinations during the 10 months in which winter wheat completes its life cycle. Doubtless the temperature and moisture relationships during a considerable part of this period are of little consequence in leaf rust epiphytology, while at other critical times these factors may play an all-decisive role in determining the outcome of the disease.

Observers commonly mention as the factors primarily responsible for leaf rust severity: abundant inoculum in the fall, a mild winter to permit generous survival of the inoculum, and a wet spring. These conditions seemed to have been met in Oklahoma in the spring of 1942. In the fall of 1941 leaf rust was unusually abundant. The winter was 2° warmer than normal. Subsoil moisture, testifying the abundance of rains, stood at the highest level in many years. January was warmer than normal and though dry was followed by normal rainfall in February. March precipitation was deficient (50% of normal) but in April, the month during which leaf rust commonly becomes conspicuous, the rainfall reached an all-time high total of more than 11 inches. Yet on May 1, many of the fields in the leading wheat areas of the State were so lacking in rust that it was not practical to collect small samples for culturing, while in the remainder of the fields the disease was nowhere threatening as the crop passed into the heading stage.

This anomalous situation suggested the desirability of a detailed analysis of the relationship between moisture and temperature on the one hand and leaf rust development on the other, at various periods in the development of the crop. Data on leaf rust occurrence in Oklahoma were available from published and unpublished sources, while the records of the U. S. Weather Bureau provided the necessary meteorological data. The study covered the 23-year period in Oklahoma from 1918 to 1941. The findings most pertinent to the problem presented are given in Table 1.

The 23 years included 8 in which leaf rust damage varied from moderately severe to very severe (5% to 27% loss), 10 years with moderate (2 to 5%) loss, and 5 years in which the rust was negligible (0 to 2% loss). Considering first those years of severe leaf rust intensity (Table 1, upper group), a strong similarity is seen in the phenological conditions from midwinter to the end of March. In all cases the winter was mild (very mild in all but one). In January and February of each epiphytotic year precipitation was normal or above normal. In each year March had normal or warmer than normal temperatures and precipitation varying from normal to excessive. The outstandingly severe epiphytotic of 1938 followed an early spring that differed from the others in the group only in the somewhat greater amount of moisture both in the January-February period and in March. In marked contrast were the phenological variations in late fall and in April. Severe epiphytotics occurred in crop years in which the fall seasons and the months of April each varied from very warm to cool and from very wet to very dry.

Table 1. -- Phenological factors in wheat leaf rust development in Oklahoma, 1918 to 1941. Underlined factors are considered inhibitory to serious rust development. Terms relating to temperature and precipitation are based on departures from normal temperature and precipitation values as given by the U. S. Weather Bureau.

Crop Year	Non-essential: Oct.-Nov. Temp.	Non-essential: Oct.-Dec. Pptn.	Essential (critical period): Dec.-Feb. Temp.	Essential (critical period): Jan.-Feb. Pptn.	Essential (critical period): March Temp.	Essential (critical period): March Pptn.	Non-essential: April Temp.	Non-essential: April Pptn.	Wheat Leaf Rust
1918-19	Sl. warm	V. wet	Mild	Normal	Normal	Normal	Normal	V. wet	Severe
1920-21	Sl. cool	V. wet	V. mild	Sl.wet	Moderate	V. wet	Normal	Normal	Mod. severe
1921-22	Warm	Dry	V. mild	Normal	Normal	V. wet	Normal	V. wet	Mod. severe
1926-27	Normal	Wet	V. mild	Sl.wet	Normal	Wet	V. warm	V. wet	Severe
1933-34	Warm	Sl. dry	V. mild	Normal	Normal	Normal	Warm	Dry	Severe
1934-35	V. warm	Sl. dry	V. mild	Normal	Warm	V. wet	Cool	V. dry	Severe
1937-38	Cool	Sl. dry	V. mild	V. wet	Warm	V. wet	Normal	Normal	V. severe
1938-39	V. warm	V. dry	V. mild	Wet	Moderate	Normal	Normal	Dry	Mod. severe
1919-20	Cool	V. wet	Cold	Normal	Normal	Wet	Cool	Dry	Moderate
1922-23	Sl. warm	Normal	V. mild	Normal	Cool	Wet	Normal	Wet	Moderate
1925-26	Cold	Sl. dry	V. mild	Normal	Cool	Wet	Cold	Dry	Moderate
1927-28	V. warm	Sl. dry	Mild	Normal	Moderate	Dry	Cold	Dry	Moderate
1928-29	Warm	Wet	V. cold	Normal	Moderate	V. wet	V. warm	Dry	Moderate
1929-30	Cold	Normal	V. cold	Sl.wet	Normal	V. dry	V. warm	Dry	Moderate
1930-31	Normal	Sl. wet	V. mild	Normal	Cold	V. wet	Cool	Dry	Moderate
1931-32	V. warm	V. wet	V. mild	V.wet	Cold	V. dry	Warm	V. dry	Moderate
1932-33	Cool	Normal	Cold	Normal	Moderate	Normal	Normal	Normal	Moderate
1940-41	Sl. warm	Sl. wet	Mild	Wet	Cool	V. dry	Normal	V. wet	Moderate
1923-24	Cold	V. wet	Mild	Dry	Cold	V. wet	Normal	Wet	Light
1924-25	V. warm	Dry	Cold	Dry	Moderate	V. dry	V. warm	V. wet	Light
1935-36	Sl. cool	Normal	V. cold	V. dry	Warm	V. dry	Normal	V. dry	Light
1936-37	Cool	Sl. dry	Cold	Normal	Cool	Normal	Normal	V. dry	Light
1939-40	Warm	Dry	V. cold	Normal	Moderate	V. dry	Normal	V. wet	Light

Abbreviations: Sl.: slightly; Mod.: moderately; V.: very; Temp.: temperature; Pptn.: precipitation.

It is noticeable that the conditions favoring severe leaf rust do not necessarily include excesses of rainfall. The essential appears to be the avoidance of subnormal deficiency of temperature or precipitation during the critical period from December to the end of March. Note that the epiphytotic of 1919 and that of 1934 were in seasons of normal precipitation from January to the end of March, in the one case preceded and followed by wet weather, in the other case preceded and followed by dry weather.

If the conditions from late winter to the end of March, as indicated in the table, are the essentials for epiphytotic leaf rust development, it should follow that every non-epiphytotic year should be deficient in one or more of these essentials. Such is the case. In the group of years in which leaf rust was only of moderate intensity 1 essential factor, or occasionally 2, were lacking each year: the winter temperatures were severe, or March was either cool to cold or dry to very dry.

The group of years with very minor rust occurrence shows even greater defects in the period of late winter till March. Here, in each case, 2 or even 3 of the essential factors are lacking.

In these latter groups, the weather of late fall or of April again bears no consistent relation to subsequent rust outbreaks. In 3 of the "light rust" years, April was wet to very wet and April temperatures were normal or warm. In the season 1922-23 conditions were very similar to those of some of the epiphytotic years with the one exception of the low temperatures in March. This, nevertheless, apparently sufficed to inhibit epiphytotic development for that year.

On the basis of this analysis the situation in 1942 is readily explainable. Throughout the critical period, temperatures were favorable but the greater part of the precipitation available for the 1942 crop came at times before and after the critical period for destructive rust development. During this period 2 months were notably dry, January and March, which, if our analysis is valid, should clearly place 1942 among the moderate or light rust years despite the excessive moisture and rapid rust development in April.

If the conditions requisite for epiphytotic leaf rust development are fulfilled 2-1/2 months before harvest and losses from the disease are thereafter relatively independent of weather, it should be possible to predict on March 31, in the latitude of Oklahoma, the approximate crop damage to be expected by harvest time in June. This could be done either by observation of the rust severity at that time or by analysis of the weather record from December through March. For other latitudes correspondingly earlier or later dates would apply. That such predictions would be useful should be evident to those crop observers who, in 1938, participated in the contradictory forecasts on leaf rust damage which were not resolved until harvest was well under way. To be sure, it would be impossible for preventive measures to intervene as late as 2-1/2 months before harvest, but the predictions would be early enough in years of severe epiphytotics to allow a reduction of loss by harvesting the wheat for hay and planting corn, sorghums, or cotton to replace a potentially ruined wheat crop. Such predictions would also aid in stabilizing the reactions of the stock market to overoptimistic crop forecasts.

It is admitted that an analysis such as the present one is handicapped by many factors, such as the inadequacy in past years of data on rust prevalence, the former tendency to underestimate leaf rust losses, and the variation in weather and rust from one part of a State to another. Moreover the entire character of leaf rust epiphytology may differ from one part of the United States to another, owing, for example, to the greater importance of northward-borne spore showers in the Northern States than in the Southwest where leaf rust regularly overwinters in large amounts, or to differences between spring and winter wheats.

The writer would be very much interested in learning whether this analysis of leaf rust epiphytology appears to be applicable in other States than Oklahoma. For a basis of comparison the dates mentioned in this account should be corrected by amounts indicated in U.S. Dept. Agr. Cir. 183 ("Seedtime and harvest," 1922). For example, April 1 in Oklahoma should be compared with May 1 in Iowa and southern Minnesota or with the middle of March in north-central Texas.
(OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER).

WHEAT LEAF RUST AND OTHER GRAIN DISEASES IN OKLAHOMA IN 1942

K. Starr Chester

In the fall of 1941, leaf rust of wheat (Puccinia triticina) [P. rubigo-vera tritici] was exceedingly abundant in Oklahoma and Kansas. The winter was relatively mild and the rust could be found sporulating at all times. An abundance of inoculum was available March 1. The month of March was abnormally dry, and the rust made very little progress until early in April when abundant rains were experienced.

In Oklahoma, April 1942 has been the wettest April on record, the precipitation being in the neighborhood of 11 inches. During the month, fields in the vicinity of Stillwater showed a rapid increase in the amount of leaf rust. On April 28, a field of Turkey wheat on the Experiment Station farm was so heavily rusted at heading time that the plants will be practically defoliated in another 10 days.

Because of this alarming development, it was felt desirable to secure further information from the main wheat-producing areas of the State. On April 30 and May 1 a survey trip was made, following the route Stillwater--Perry--Tonkawa--Pond Creek--Enid--El Reno--Edmond--Guthrie--Stillwater. Fields were sampled every 5 miles. It was surprising, considering the abundant April rainfall, to find that leaf rust was extremely scarce throughout all of this area except in the immediate vicinity of Stillwater. In many fields it was impractical to collect enough rust for greenhouse culturing. Fields of Tenmarq wheat were practically rust-free, and plants of the more susceptible varieties ordinarily showed but a very light sprinkling of rust on the lower leaves and little or none at all on the uppermost 2 leaves. Much of the foliage, however, was mottled with chlorotic areas, interpreted as incipient rust lesions, capable of producing a considerable supply of inoculum for Northern areas within the next 10 days.

On the average, this wheat is in the boot stage or just heading, although a few fields were still in the jointing stage and Early Blackhull wheat was past blossoming stage.

There was little indication of other contagious disease. Speckled leaf blotch (Septoria tritici Desm.) was present but in relatively small amount on the lowest leaves and occasionally causing brilliant yellow lesions on the foliage. Small amounts of leaf rust (Puccinia anomala Rostr.) were found on barley, and in the two or three rye fields encountered, the rye leaf rust (Puccinia dispersa Eriks.) [P. rubigo-vera secalis (Erikss.) Carl.] was quite abundant. No crown rust or stem rust has been seen or reported thus far.

On May 1, Mr. W. M. Osborn forwarded specimens of wheat representative of the leaf rust infestation in the vicinity of Lawton, Oklahoma. The leaves bore scattered pustules of an intensity estimated at 25%. Mr. Osborn mentions that rust development has been inhibited until the past 10 days, during which time it has been favored by abundant rainfall. No stem rust was reported from Lawton.

On May 2, Mr. V. C. Hubbard of the Woodward, Oklahoma experiment station, also forwarded specimens of wheat rather lightly rusted. He also remarks that the disease has been quite inactive until the past 2 weeks, and the wheat is sufficiently advanced that serious damage from leaf rust is not expected. Mr. Hubbard indicates that the situation in the Panhandles of Oklahoma and Texas is similar to that about Woodward.

The scarcity of leaf rust following an extremely rainy month of April suggested that March precipitation and temperatures of winter and early spring are of much greater importance in wheat leaf rust epiphytology than the weather of April, the month during which the rust commonly becomes most apparent in Oklahoma. This observation suggested a phenological analysis of leaf rust outbreaks in past years. Such an analysis has been made and fully supports the view that so far as Oklahoma is concerned the weather from April 1 onward has very little to do with the destructiveness of leaf rust in any given year.

(OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER).

ADDITIONAL REPORTS ON DISEASES OF SMALL GRAINS

CEREAL RUSTS IN KANSAS: This spring in north-central Kansas has been the nearest "normal" that the writer remembers. There have been no sudden severe freezes or frosts following long periods of warm weather during which plant growth came on too rapidly. Although the winter was mild, normally cold weather persisted well into March and prevented plants coming out of dormancy too soon or too rapidly. While rainfall is below normal for the first 4 months of the year in the vicinity of Manhattan, there still is an abundance of moisture in the soil. In the western part of the State more rain has fallen than at Manhattan. Rains ranging from 1/2 inches to more than 2 inches fell in most parts of the State last weekend. A total of .59 inch was received here.

Leaf rust [Puccinia rubigo-vera tritici] of wheat overwintered in fair abundance as far north as Manhattan, but there has been almost no natural increase owing to low night temperature.

Trapping of rust spores was started on April 1 and some spores of both leaf rust and stem rust are being trapped. The numbers to date have been low. Reports from Texas indicate that leaf rust of wheat, crown rust [P. coronata] of oats, and stem rust [P. graminis] on both wheat and oats are plentiful in the lower Rio Grande Valley and around San Antonio. The damage to small grains caused by greenbugs in north-central Texas and south-central Oklahoma may reduce or delay the northward migration of cereal rusts this year. (C. O. Johnston, Division of Cereal Crops and Diseases, Bureau of Plant Industry. April 22).

GRAIN DISEASES REPORTED FROM CALIFORNIA: April, to date, has been cold and unusually wet, precipitation totaling 3.32 inches. Scald [Rhynchosporium secalis] on barley and septoria [S. tritici] on wheat are severely damaging leaves of susceptible varieties. Oat stem rust is the only rust sufficiently abundant locally to be threatening at this time. Lodging will probably be severe.

Barley stripe [Helminthosporium gramineum], which was only rarely encountered from 1937 to 1940, is "on the loose." One-third of the fields examined on a trip over Yolo County last week showed more than 1% diseased plants and several more than 10%, even though plants were generally not sufficiently developed to give full expression to the disease. (C. A. Suneson, Division of Cereal Crops and Diseases. April 14).

WHITE ROT OF ALLIUM IN LOUISIANA

E. C. Tims

On March 19, 1942, white rot, caused by Sclerotium cepivorum Berk., was found on shallot plants (Allium ascalonicum) on a farm in the outskirts of the town of Convent, St. James Parish, Louisiana. This is the first authentic record of the disease in this State. A few days later it was also found on garlic (Allium sativum) and onion (Allium cepa) on the same farm. Specimens of the infected shallots were sent to J. C. Walker, who verified the diagnosis.

Later observations showed that the white rot disease appears to be limited in the principal shallot-growing area of the State to a few farms within some 10 miles of the town of Convent. One minor infection was found near Union, Ascension Parish, only a few miles from the infections around Convent. Just how long the disease may have been present in this area is not known. One farmer said he had seen it for several years. His description of the disease and how it spread indicated that he was probably correct in his statement. One farmer said his shallots had been dying all during the past winter, but he had apparently paid little attention to the disease condition and had not reported the trouble to the plant pathologists.

While the disease was quite severe in the infected areas, it had apparently not spread to any very great extent. On the farm where infected onions were found there were only a few diseased plants in the vegetable garden. The infected shallots were found in a nearby plot of

possibly 3 acres. A row of garlic planted among the shallots was almost wiped out by the disease. Infected garlic plants were found on 2 other farms, the disease there having been very destructive on both garlic and shallots. Some areas were found in which all the plants were killed while around the edges of the infected areas there were plants in various stages of decay. Altogether the known infected fields comprised an area of some 15 acres on 4 different farms. Observations indicated that the disease might be equally severe on garlic or shallot when grown in infested soil. No intensive survey was made of the shallot, garlic, or onion-growing sections of the State, but some representative fields were examined in the area extending from Angola, some 60 miles above Baton Rouge, down the Mississippi River to Laplace and down Bayou Lafourche as far as Schriever.

White rot caused some concern among onion growers and plant pathologists in this country about 20 years ago following the description of the disease in Europe by Walker (6). According to Walker it was widespread in western Europe and in certain onion-growing sections caused serious damage to onion, leek, and garlic. Later Walker (7) mentioned that only two authentic reports had been made of white rot in the United States, on garlic and onions in Oregon in 1918 and on onions near Norfolk, Virginia, in 1923. A third authentic report of the disease in America was made in 1925 by Valleau (5), from Kentucky.

In 1926 Walker (8) published studies on the effect of soil temperature and soil moisture on white rot of multiple onion, Welch onion, and garlic. He found that the disease developed best at comparatively low temperatures, 10° - 20° C., at 20° and 22° C. there was a marked reduction in infection, and at 24° C. or above the disease did not develop. His earlier observations in Europe indicated that white rot was most destructive during the earlier portion of the growing season and that its progress was checked by the warmer midsummer weather. Walker's tests also indicated that a moisture content of about 40% of the water-holding capacity of the soil was most favorable for the development of the disease.

In 1925 McWhorter (4) reported the recurrence of white rot of shallot near Norfolk, Virginia, in new land. The shallot sets had come from Louisiana, and he inferred that the disease might have been brought in on the infected sets. Wingard (9) in 1930 reported an attempt to control white rot in the field in Virginia. The plot consisted of about one-fourth acre in which the onion bulbs were treated with formaldehyde before planting, one row being left as a control. There were practically no healthy onions in the entire plot at the end of the season, those in the treated row being as badly diseased as the ones that were not treated. Wingard thought that infection probably came from the garden and remained on the farm several years.

In 1936 Edson (2) quoted a report from the New Jersey Agricultural Experiment Station, Department of Plant Pathology, that "White rot (Sclerotium cepivorum) was severe in one field in New Jersey. It occurs in several sections of the State but is not generally distributed." In 1938 Gardner (3) reported its occurrence on garlic in California in one field in San Mateo County, and in another planting in San Benito County.*

* [Also, in 1940, C. E. Scott reported its occurrence in Mendocino County on onion - PDS]

Cook (1) in 1939 again reported having received a specimen of white rot of onion from Warwick County, Virginia. The onion was taken from a field just across the road from the farm where McWhorter found the disease in 1924-25. No onions had been grown on this farm for 15 years, but at the time the specimen was sent in 75% of the plants were badly affected. In recent years there have not been many reports of white rot, and apparently it has not become so widespread and destructive as had been feared.

The white rot disease is potentially a very serious disease of garlic, onion, and shallot in Louisiana. These crops are all grown during the winter and spring seasons when temperature conditions are favorable for the development of the disease. Sclerotia are produced in large numbers on the infected plants. Most of these plants die and are left in the fields, and as they disintegrate the sclerotia are left in the soil to serve as a source of infection. The sclerotia in the infected soil may be carried from one field to another, or to different parts of the same field on farm implements, or on the feet of livestock or workmen. According to Walker (7) the fungus is known to live for several years in the soil without the presence of the host plant. The disease may also be introduced to uninfected areas by the use of infected shallot sets or garlic cloves for planting. Thus there are numerous possibilities for the spread of white rot in the shallot and garlic-growing sections of southern Louisiana.

1. Cook, H. T. Reccurrence of white rot of onion in Virginia. Plant Dis. Reporter 23: 5. 1939.
2. Edson, H. A. Diseases of plants in the United States in 1935. Plant Dis. Reporter Suppl. 96: 190. 1936.
3. Gardner, M. W. Sclerotium cepivorum found on garlic in California. Plant Dis. Reporter 23:36. 1939.
4. McWhorter, F. P. Sclerotium cepivorum recurs in the Norfolk section of Virginia this year. Plant Dis. Reporter 9: 5. 1925.
5. Valleau, W. D. White rot (Sclerotium cepivorum) of onion reported from Kentucky. Plant Dis. Reporter 9: 46-47. 1925.
6. Walker, J. C. Observations on the cultivation and diseases of cabbage and onions in Europe. Plant Dis. Reporter Suppl. 32: 3-34. 1924.
7. Walker, J. C. Occurrence of white rot of Allium (Sclerotium cepivorum Berk.) in Europe and America. Phytopath. 14: 315-322. 1924.
8. Walker, J. C. The influence of soil temperature and soil moisture upon white rot of Allium. Phytopath. 16: 697-710. 1926.
9. Wingard, S. A. White rot of onions in Virginia. Plant Dis. Reporter 14: 104-105. 1930.

(LOUISIANA AGRICULTURAL EXPERIMENT STATION, BATON ROUGE).

WETTABLE SPERGON NOT EFFECTIVE AS A SURFACE DISINFECTANT OF SWEETPOTATOES USED FOR SEED

H. T. Cook and L. L. Harter

O. H. Elmer (PDR 26 (2): 44-46. 1942) called attention to the possible value of Spergon for treating sweetpotato "seed" before bedding and suggested that other investigators test it for this purpose. Accordingly Wettable Spergon was included in tests that were being conducted at the Virginia Truck Experiment Station in an effort to find a suitable substitute for the standard corrosive sublimate treatment used successfully for the last 30 years, but not now practical because of the high cost and scarcity of mercury.

Since the primary purpose of treating sweetpotato seed is to prevent infection by black rot [Ceratostomella fimbriata] spores frequently present on the surface, preliminary tests were conducted in the laboratory to determine whether or not Wettable Spergon and certain other materials, compared with corrosive sublimate, would prevent infection. Sweetpotatoes were peeled and cut into cubes that were dipped in an aqueous suspension of dry, powdered, black-rot infected sweetpotato tissue. The cubes were treated in the various chemical solutions and then placed in separate moist chambers and incubated at room temperature for 1 week. The untreated check was soaked in a volume of water equal to the volume of the treating solutions used.

Wettable Spergon was used in these tests at concentrations of 2, 4, and 6 ounces in a gallon of water; corrosive sublimate at 1-1000. In the first test the sweetpotato cubes were merely dipped in the Spergon solution for about 1-1/2 minutes; in the others they were soaked for 10 minutes. In all tests treatment with corrosive sublimate was for 10 minutes. The results are given in the following table.

Treatment	Growth of black rot fungus on treated sweet potato cubes		
	1st test	2nd test	3rd test
Check (untreated)	Abundant	Abundant	Abundant
Corrosive sublimate	None	None	None
* Spergon 2 oz. - 1 gal.	Moderate	Abundant	Abundant
Spergon 4 oz. - 1 gal.	Moderate	Moderate	Abundant
Spergon 6 oz. - 1 gal.	Slight	Moderate	Abundant

* Concentration used by Elmer as a dip.

Since Wettable Spergon failed to control black rot even when the seed was soaked in the strongest solution, it does not appear to be a suitable material for treating sweetpotato seed for disease control. Some of the other materials used in these preliminary tests controlled black rot as effectively as the standard corrosive sublimate treatment and their effect on sprout production is now being tested. Because of the present emergency the complete results of these tests probably will be published as soon as they are completed early in June.

(VIRGINIA TRUCK EXPERIMENT STATION, NORFOLK; AND DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY).

BRIEF NOTES ON PLANT DISEASES

DISEASES IN CIGAR-WRAPPER TOBACCO PLANT BEDS IN FLORIDA IN 1942: Downy mildew (Peronospora tabacina) appeared late this season, and caused slight damage in a few commercial beds. Two new spray materials tried at Quincy, Florida, appeared promising for downy mildew control when applied twice a week. Ferric dimethyl dithiocarbamate (du Pont's IN-870 A3), 1-1/2 pounds per 100 gallons, gave excellent control, a little better than cuprous oxide-cottonseed oil emulsion; leaves sprayed with this new material were much darker green than unsprayed leaves. Tetrachloro-para-benzoquinone (U. S. Rubber Company's Spergon), paste form, 40% active ingredient, 4 pounds per 100 gallons, gave good control, about the same as cuprous oxide-cottonseed oil emulsion. The disease appeared in the plots 4 weeks after spraying was started and 1 week before the first transplanting. There was no evidence of plant injury by the new materials, except slightly yellowish blotches on leaves bearing a heavy black deposit of the du Pont material. Plants sprayed with both materials lived well when transplanted in the field.

Black-leg (Bacillus aroideae Towns.) [Erwinia] killed 10% of the plants in a 5000-sq. yd. commercial bed. The stand was extremely thick, and following a heavy rain on April 16, patches of plants became involved in a wet, slimy rot, collapsed and turned black. This is apparently the first record of the occurrence of black-leg in plant beds in Florida. (Randall R. Kincaid, North Florida Experiment Station, Quincy, Florida).

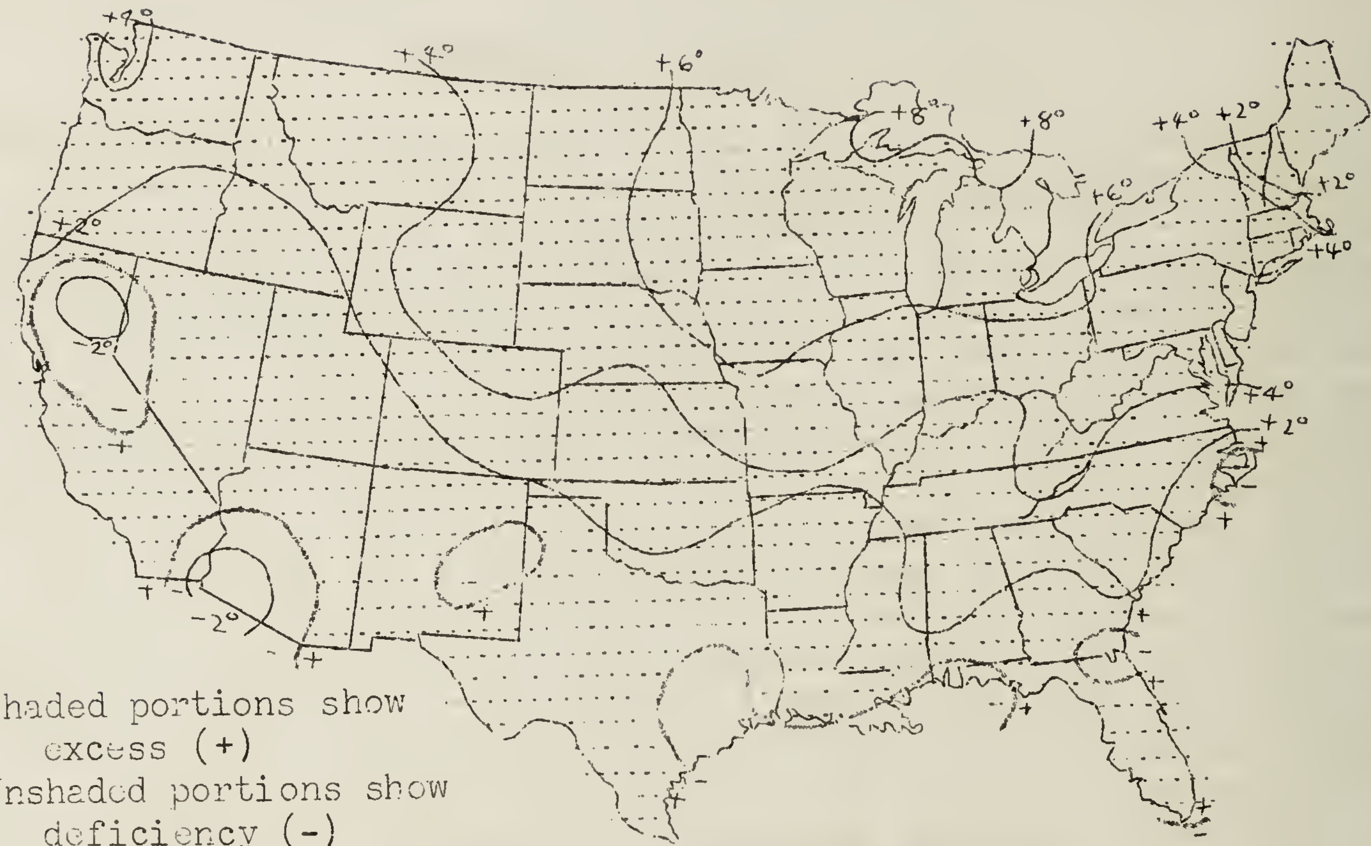
PINK ROOT OF SHALLOTS IN LOUISIANA: Pink root, Phoma terrestris, was apparently the most serious disease affecting shallots during the latter part of the growing season. Infection ran as high as 5% in some fields, and practically no fields were found free of the disease. The diseased plants were stunted, the tips of the leaves were yellow. and the root systems were poorly developed. Most of the pink-root infected plants were too small and unsightly to be sold. (E. C. Tims. Louisiana Agricultural Experiment Station, Baton Rouge).

AMERICAN PHYTOPATHOLOGICAL SOCIETY EMERGENCY COMMITTEE ON PLANT DISEASE PROBLEMS: In the A.A.A.S. Bulletin for May (1 (3):18-19) J. G. Leach names the members of this committee and states the problems that face it.

APRIL WEATHER

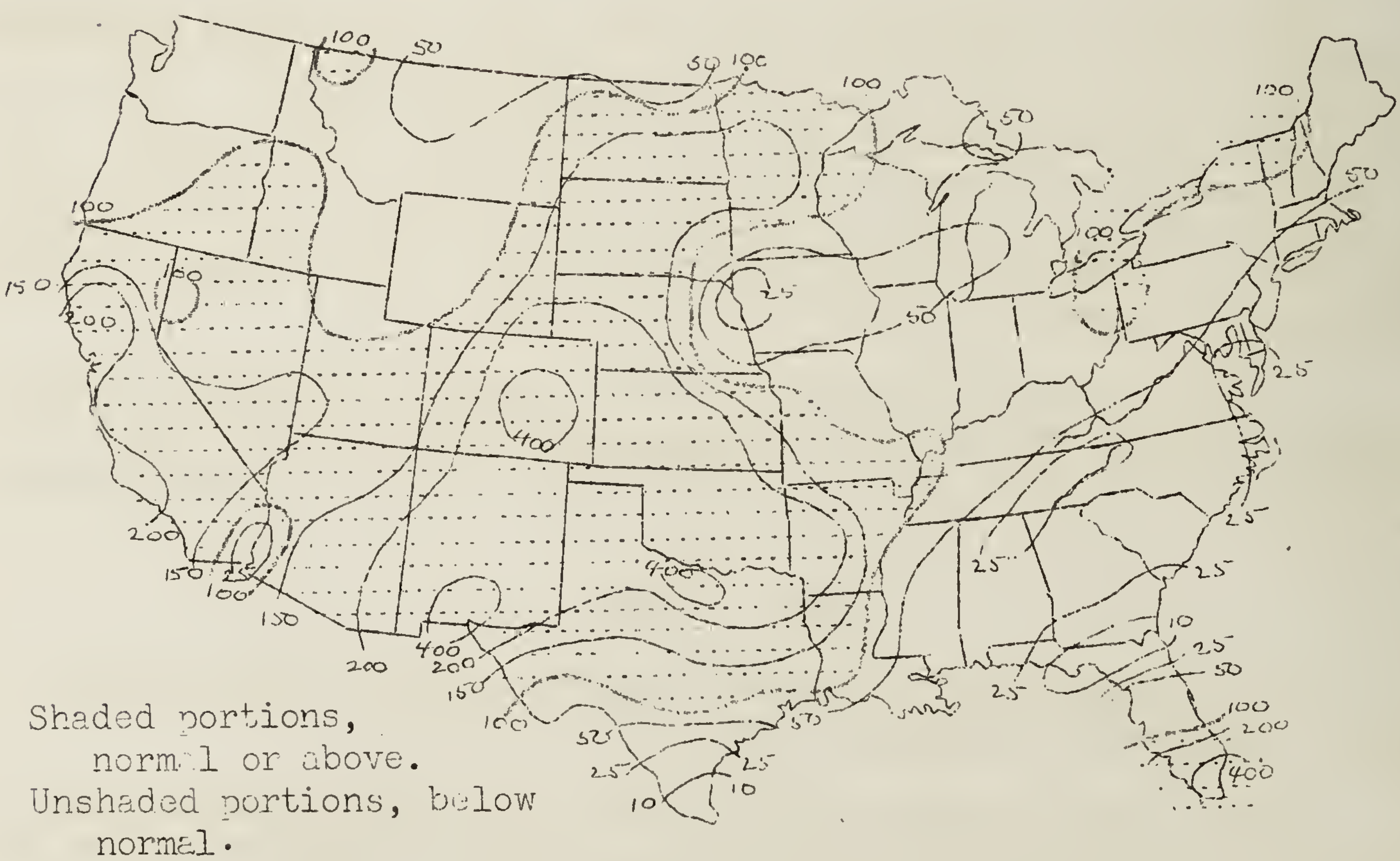
(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending May 5, 1942).

Except very locally, the temperature for April averaged above normal in all sections of the country, as shown by Figure 1. East of the Rocky Mountains the pattern was quite similar to that for the preceding month. While the monthly means for April were slightly above normal and somewhat higher than for March in the Southern States, central and northern sections had abnormally warm weather with plus anomalies



Shaded portions show
excess (+)
Unshaded portions show
deficiency (-)
Lines show amount of excess or deficiency.

Figure 1. -- Departure of Mean Temperature from the Normal for April 1942.



Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Figure 2. -- Percentage of Normal Precipitation for April 1942.

ranging mostly from 4° to 11°, comparable with those for March. West of the Rockies temperatures averaged slightly above normal, except locally, in contrast with decidedly subnormal values last month in much of the area.

While the temperature anomalies for the 2 months were quite similar, the precipitation pattern, see Figure 2, was markedly at variance in several respects. March was decidedly dry in a large southwestern area and much wetter than normal in most of the Atlantic States, while April had abnormally heavy rains over approximately the same southwestern section and one of the driest Aprils of record in much of the East. In the Atlantic area the scanty rainfall extended from New England southward and southwestward to northern Florida and Mississippi with practically all stations reporting less than half the normal rainfall and some having less than 10 percent of normal.

The following summary affords an indication of the extent of the drought and a comparison with previous records in some areas. At Hartford, Connecticut, it was the driest April since the beginning of the record in 1847; at Baltimore, Maryland, the monthly total, 0.88 inch, equaled April 1922, the previous driest since 1869; Washington, D. C., the driest in 95 years; Richmond, Virginia, the driest of record, the next driest being April 1888 with more than twice as much rainfall; Charlotte, North Carolina, the second driest of record; both Savannah, Georgia, and Jacksonville, Florida, the driest in 50 years; and Birmingham, Alabama, and Chattanooga, Tennessee, the driest of record. While northern Florida was very dry, extreme southern Florida had heavy rains; Miami reported 13.62 inches, by far the greatest April rainfall of record.

Between the Mississippi River and Rocky Mountains there were a couple of restricted sections, Iowa and extreme southern Texas, with markedly deficient rainfall, but elsewhere the amounts were much above normal, especially in the Southwest where a large area had from two to four times the normal amount of rain for the month. At North Platte, Nebraska, it was the wettest April since 1875, while Pueblo, Colorado, Dodge City, Kansas, and Ft. Worth, Texas, all had the second wettest of record. In the far West, California had a decidedly wet month, but rainfall was below normal in the Pacific area north of California.

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IN THIS ISSUE

AN ANNOTATED LIST OF THE PARASITIC FUNGI ON CEREALS AND OTHER GRASSES IN KLICKITAT COUNTY, WASHINGTON 1/

Roderick Sprague 2/

Klickitat County, Washington, extends as an elongated trapezoid-shape area bordered by the Columbia River on the south, the Cascade range on the west, Yakima County on the north, and arid Benton County on the east. The average annual precipitation of Klickitat County ranges from about 40 inches in the rugged pine-covered western edge to less than 10 inches in the bunch grass area of the eastern half. Except for a narrow strip of upper Sonoran Zone devoted variously to fruit, forage, and garden crops along the floor of the Columbia River gorge, most of the region is a rugged to rolling foothills plateau devoted to lumbering (western portion), cereals (central portion of Agropyron-Festuca sod grasses), and grazing (eastern and general). There is a fertile, dairy area centering at Troutlake in a valley at the base of Mt. Adams. At White Salmon the fruit district extends up beyond the floor of the gorge into the adjacent hills.

The Klickitat country has long been of interest to botanists, particularly taxonomists and plant ecologists, on account of the studies of the pioneer plant taxonomist W. N. Suksdorf (2). Piper (3) discussed the area in his flora, pointing out that many of the plants that occur along the warm, north side of the Columbia Gorge (southern slope) are hundreds of miles north of their next most northernly point of occurrence.

The present study is based on random collections made at irregular intervals mostly along the Evergreen Highway from Bingen to Goldendale or in the vicinity of High Prairie, Washington, where cereal disease investigations were in progress from 1929 to 1940. The numbers (e.g., 8079) refer to the herbarium numbers of the Mycological Herbarium at Oregon State College. A number of the specimens are represented in the Mycological Collections of the Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C., and in the Collections of the Department of Plant Pathology, Washington State College, Pullman, Washington. The collections, unless appended by the collector's name (e.g., Suksdorf 532), were made by the writer.

This list gives 28 genera of fungi, including at least 73 recognized species and varieties, and a total of 191 host-pathogen combinations. The total number of collections cited is 327, found on about 53 gramineous hosts.

1/ Cooperative investigations between the Divisions of Cereal Crops and Diseases and Forage Crops and Diseases, Bureau of Plant Industry U. S. Department of Agriculture, and the Washington Agricultural Experiment Station.

2/ Pathologist, Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture.

SCHIZOMYCETES

EUBACTERIALES

BACTERIUM CORONAFACIENS Elliott var. ATROPURPUREUM Reddy & Godkins (CHOCOLATE SPOT)

This organism is less common on the warmer, drier Klickitat County side of the Columbia Gorge than on the opposite shaded bank in Oregon.

On Bromus carinatus Hook. & Arn. Seen at Bingen. (No specimen collected.)
B. tectorum L., Bingen, 8088.

PHYCOMYCETES

PHYCOMYCETE on Poa pratensis L., 5 miles east of Bingen, 457. A primitive unilocular body or cluster of large cells imbedded in a leaf spot. No one has been able to identify this even to an order as yet. It may be near the Chytridiales. This or a group of similar fungi are common on grasses in Oregon during the humid winter months.

ASCOMYCETES

ERYSIPHALES

ERYSIPHE GRAMINIS DC. (POWDERY MILDEW).

Except in early season powdery mildew is not common in Klickitat County. It is most destructive on some of the native bluegrasses (Poa spp.) growing in the shade of rocks along the Columbia Gorge. It was prevalent on Elymus condensatus Presl in the Goldendale Valley following the moist rains of June 1937.

On Agropyron spicatum (Pursh) Scribn. & Smith, 4 miles east of Lyle, 8063; near Wishram, 172.
Bromus carinatus Hook. & Arn., Underwood, 10867; 4 miles east of Lyle, 8085.
B. rigidus Roth., Bingen to Lyle, 8101.
B. tectorum L., Lyle to Bingen, 8102.
Elymus condensatus Presl., Goldendale Valley to Lyle 8328, 8392.
E. glaucus Buckl., west of Wishram, 209.
Festuca idahoensis Elmer, near Lyle, 8117.
Hordeum vulgare L., observed on High Prairie in 1934 (no specimen).
Koeleria cristata (L.) Pers., Maryhill Grade (no specimen).
Poa canbyi (Scribn.) Piper, High Prairie, 8116.
P. pratensis L., Lyle to Bingen, 8072; Maryhill grade, 208.
P. scabrella (Thurb.) Benth., 6 miles west of Lyle, 8123.
P. secunda Presl, High Prairie, 8113, 8146; east of Bingen, 8080; Maryhill Grade, 8087, 8075; 5 miles west of Maryhill, 8069; 2 miles northeast of Lyle, 260; near Lyle, 500.

P. vaseyochloa Scribn., 4 miles west of Lyle, 499, 501; 8079, 8251; across the river from Mosier, Oregon, 574 A.
Polypogon monspeliensis (L.) Desf., Maryhill and vicinity, 8128, 8138, 8139, 223.
Triticum aestivum L., Lyle; seen in 1933, 1934, 1935, 1936, 1937 on High Prairie, 8309.

SPHAERIALES

MYCOSPHAERELLA TULASNEI Jacz. (LEAF MOLD).

This and its Cladosporium stage are prevalent on the overwintering leaves of a number of grasses. In most cases the fungus is obviously a saprophyte on old dead overwintering plant tissue. In a few cases the fungus appears to be a mild parasite particularly on the perennial foliage of Idaho fescue:

On Agropyron spicatum (Presl) Scribn. & Smith, Satus Pass, 10972.
Festuca idahoensis Elmer, High Prairie, 10971; Satus Pass, 10964.
Holcus lanatus L., Bingen, 10942.
Poa compressa L., 5 miles north of Husum, 8248 (Conidial stage
Trisetum canescens Buckl., 8 miles northeast of Lyle, 8422.
Triticum aestivum L., High Prairie, 8307.

MYCOSPHAERELLA SPP.

The following collections have not been definitely determined and may also be M. tulasnei:

On Elymus triticoides Buckl., Warick, 117.
Poa canbyi (Scribn.) Piper, Lyle, 8119.
P. secunda Presl, Maryhill, 8071.

FUNGI IMPERFECTI

SPHAEROPSIDALES

ASCOCHYTA SP.

Causes a vaguely formed leaf spot on winter barley (Hordeum vulgare L.) on High Prairie in early spring, 471, 771, 10867, 10959. The same fungus occurs on Holcus lanatus L. near Bingen, Wash., 8081, 8089. This group is being studied at present.

DARLUCA FILUM (Biv.) Cast.

A common associate and parasite on rusts in western Oregon (8) and Washington, but rare in Klickitat County, particularly east of Lyle While inhibiting the rust it also seems to do the host plant no particular good in some instances.

On Puccinia coronata Corda on Holcus lanatus L., Bingen, 507, 8083, 8089; White Salmon, 210
P. poae-sudeticae (Westend.) Jørstad on Poa nervosa (Hook.) Vasey, Lyle, 8110.
P. poae-sudeticae (Westend.) Jørstad on Poa pratensis L., Lyl 512; Bingen, 8072; 5 miles east of Bingen, 511.

DILOPHOSPORA ALOPECURI (Fr.) Fr.

George Fischer found abundant material of this fungus on Sitanion jubatum J. G. Smith, in the Goldendale Valley following heavy rains in June 1937, 10892; Centerville, 755; Warick, 8408; Maryhill Grade, 8413.

HENDERSONIA AGROPYRI-REPENTIS Oud. (Near H. culmicola Sacc.)

On Elymus glaucus Buckl., near Lyle, 475.

HENDERSONIA CULMICOLA Sacc.

On Poa secunda Presl, Maryhill Grade, 323.

SELENOPHOMA DONACIS (Pass.) Sprague & Johnson

On Elymus condensatus Presl, Warick, 764, 8392; High Prairie, 8380.

SELENOPHOMA DONACIS (Pass.) Sprague & Johnson var.

On Agropyron spicatum (Pursh) Scribn. & Smith, Klickitat Hills, 8426.

A. repens (L.) Beauv., 4-1/2 miles west of Bingen, 769.

Festuca idahoensis Elmer, Lyle, Wash. (Fischer)

Poa juncifolia Scribn., near Underwood, 10981.

P. secunda, Maryhill, 8087.

SEPTORIA ELYMI Ell. & Ev. (LEAF BLOTCH).

This disease is very common on Agropyron repens in certain places along the Columbia Gorge between Lyle and Bingen, and occurs on Agropyron spicatum and Elymus glaucus in central Klickitat County.

On Agropyron repens (L.) Beauv., near Bingen.

A. spicatum (Pursh) Scribn. and Smith, Klickitat Hills, 10925; near Wishram, Wash., 172.

Elymus glaucus Buckl., 4 miles east of Bingen, 8065; across Columbia River from Mosier, Oreg., 8066; 8132; Klickitat Gorge, 8128; Lyle, 8129; High Prairie, 176.

SEPTORIA INFUSCANS (Ell. & Ev.) Sprague[3/]

A common leaf mottle on rye grasses in the arid hills of central and eastern Klickitat County. It was very common in June 1938 and again in June 1939.

On Elymus condensatus Presl, High Prairie, 8380; Warick, 8392; Centerville, 537; western Goldendale Valley, 699; near Warick, 764; Wishram, 10922.

E. triticoides Buckl., Warick, 117, 8378, 8423; near Centerville, 577.

E. glaucus Buckl., Klickitat Gorge, 8420.

SEPTORIA JACUCELLA Sprague[4/]

On Bromus rigidus Roth, 4 miles west of Lyle, 8070.

B. tectorum L., near Lyle, 8082, 8133.

3/ In Cooke, W. B., Mycobiota No. 113, 1940.

4/ In Cooke, W. B., Mycobiota No. 114, 1940.

SEPTORIA KOELERIAE Cocc. & Mor.

This is not uncommon and in very early spring is sometimes locally abundant.

On Koeleria cristata (L.) Pers. in the Klickitat Hills, 8145; High Prairie, 429; 659.

SEPTORIA MACROPODA Pass. var.

This is a very common leaf blotch on leaves in the early spring. This large spored variety of S. macropoda is apparently indigenous to the interior of western America. The collections on Poa ampla approach S. tritici in size.

On Poa ampla Merr., Klickitat Canyon, 8077, 399, 8144, 8165.
P. nervosa (Hook.) Vasey, Lyle, 8143. This collection belongs near S. macropoda var. septulata (Gz. Fr.) Sprague, which is common on P. pratensis in western Washington.
P. scabrella (Thurb.) Benth., Klickitat Canyon, 144, 10999; Satus Pass, 3178.
P. secunda Presl, general on the prairies, 8087; 8140; 8142; 8146; 8156; 8166; 400; 402; 403; 1; 2; 4; 100; 103; 169; 170; 177.
P. vaseyochloa Scribn., upper Klickitat Creek, 8114; High Prairie, 400, 401.

SEPTORIA OUDEMANSII Sacc. (TAN LEAF SPOT).

On Poa pratensis L., near White Salmon, 10968; 15 miles west of Maryhill, 8074.
Poa secunda Presl, Maryhill, 8087.

SEPTORIA POLIOMELA Sydow. (BUFF LEAF SPOT).

On Deschampsia danthonioides (Trin.) Munro, near High Prairie in the Klickitat Hills, 8130.

SEPTORIA TRITICI Rob. (LEAF SPOT AND BLOTCH).

The rosettes of winter wheat are often 100% infected with S. tritici after the snows leave the prairies in March.

On Triticum aestivum L., Goldendale Valley, 134; 138; 438; 8028; High Prairie, 8027; 8029; 97; 111; 46; 443; 444; 437.

SEPTORIA TRITICI Rob.

Isolated from Avena sativa L. on High Prairie in 1934 but apparently no specimen was retained in the herbarium by the writer.

WOJNOWICIA GRAMINIS (McAlp.) Sacc. & D. Sacc. (SECONDARY ROOT ROT).

A majority of the citations to this fungus are based on determinations from pure culture isolations (5), (9).

On Agropyron cristatum (L.) Gaertn. High Prairie. From isolation
Avena sativa L. High Prairie, 8037.
Hordeum vulgare L. Centerville, High Prairie. From isolation
Secale cereale L. High Prairie. From isolations.
Triticum aestivum L. High Prairie, Centerville, 7023. From isolations.

T. dicoccum Schrank, High Prairie. From isolations.
T. durum Desf., High Prairie. From isolations.
T. monococcum L., High Prairie. From isolations.
T. spelta L., High Prairie. From isolations.

UNDETERMINED BLACK SPOT.

In early season, Agropyron spicatum (Pursh) Scribn. & Smith is sometimes affected with a leaf spot developing first as small circular brown lesions, later elongating and turning black. The black color is due to stromatic tissue, black at the surface but hyaline beneath. It is more or less interrupted and grouped into pycnidial-like units. The fungus has some resemblance to Septogloeum oxysporum Sacc., Bomm. & Rouss., or it might be the pycnidial stage of a species of Phyllachora, but no spores have been seen. It has been found a number of times in late February and early March in shaded areas on the hills above Wishram, but only one collection is filed, 10926, collected February 27 near Wishram during the unseasonably early spring of 1935. It is often widespread but seldom serious, as usually only a few spots occur on a plant.

MELANCONIALES

PSEUDODISCOSIA AVENAE Sprague & Johnson. (RED LEATHER LEAF).

On Avena sativa L., High Prairie (Type locality) (4) (10). 8036.

MONILIALES

CERCOSPORELLA HERPOTRICHOIDES Fron. (CERCOSPORELLA FOOT ROT).

This is the most important parasite on Gramineae in the county. It does extensive damage to cereals on High Prairie and adjacent parts and occurs in the Goldendale Valley near Centerville. It has been fully discussed elsewhere (6) (9) and has been reported on the following hosts from the region: Agropyron cristatum (L.) Gaertn., Avena sativa L., Hordeum vulgare L., Secale cereale L., Triticum aestivum L., T. dicoccum Schrank, T. durum Desf., T. monococcum L. and T. spelta L.

CERCOSPORELLA HOLCI Sprague (7) (LEAF SCORCH).

On Holcus lanatus L., Bingen, 8089, 8135; 2 miles west of Lyle, 131.

EPICOCCUM PURPURASCENS Ehrbg. (LEAF MOLD).

The pathogenicity of this organism is questionable, but it may have some deleterious effect upon the seeds.

On Holcus lanatus L., Bingen, 8081, 8089.

FUSARIUM CULMORUM (W. G. Sm.) Sacc. (ROOT ROT).

This fungus has been isolated from the roots of various cereals (9) and grasses. It is particularly destructive on spring oats on the prairies and is a secondary rot on Cercosporella-infected plants. On the grasses it appears to be aggressive on Bromus tectorum L. and Hordeum jubatum L. Associated with it are F. equiseti (Cda.) Sacc., F. scirpi Lamb. & Fautr. var. acuminatum (Ell. & Ev.) Wr. and F. oxysporum Schlecht.

On Agropyron cristatum (L.) Gaertn., pure culture isolations (6).
Avena sativa L., High Prairie, 8170 (det. by Miss Helen Johann).
Bromus tectorum L., High Prairie, pure culture isolations.
Hordeum jubatum L., High Prairie, pure culture isolations.
H. murinum L., High Prairie, 8157.
H. vulgare L., High Prairie, Centerville, pure culture isolations.
Secale cereale L., High Prairie, pure culture isolations.
Triticum aestivum L., High Prairie, Centerville, pure culture isolations.
T. dicoccum Schrank, High Prairie, pure culture isolations.
T. durum Desf., High Prairie, pure culture isolations.
T. monococcum L., High Prairie, pure culture isolations.
T. spelta L., High Prairie, pure culture isolations.

FUSARIUM SPP. (LEAF SPOTS AND ROOT ROTS).

Most but not all of this miscellaneous group have been found on definite gray or sordid spots on the leaves of grasses in late "open winters" or in early spring. The spores of these collections are mostly 1-septate, relatively small, scarcely heeled and may be close to F. nivale (Fr.) Ces.

On Bromus carinatus Hook. and Arn., Lyle, 8097.
B. mollis L., a red leaf mold in early spring, High Prairie, 472.
B. tectorum L., Lyle to Bingen, 136, 8096; Maryhill, 10851, 8137; Warick, 98, 124.
B. rigidus Roth, 4-1/2 miles east of Bingen, 109.
Elymus glaucus Buckl., near Lyle, 10927.
Hordeum murinum L., Maryhill Grade, 8136, 8157.
H. nodosum L., 2 miles east of Lyle, 8134.

HELMINTHOSPORIUM BROMI Died.

This fungus was prevalent on seedlings in March 1937.
On Bromus tectorum L., near Underwood, 10963.

HELMINTHOSPORIUM DICTYOIDES Drechsl.

On Festuca occidentalis Hook., near Bingen, 473.

HELMINTHOSPORIUM SATIVUM P. K. & B. (LEAF SPOT, ROOT ROT and CROWN ROT).

On Bromus carinatus Hook. & Arn., opposite Celilo Falls, 8068.
Hordeum murinum L., High Prairie, 8157.
H. vulgare L., Centerville, 8034.
Phleum pratense L., Bingen, 8099.
Triticum aestivum L., Goldendale Valley, pure culture isolations.

HELMINTHOSPORIUM TRITICI-REPENTIS Died.

On Elymus glaucus Buckl., 8 miles northeast of Lyle on old road to Goldendale, 8435.

HELMINTHOSPORIUM VAGANS Drechsl. (LEAF ROT and PURPLE SPOT).
On Poa compressa L., 5 miles north of Husum, 8248.
Poa pratensis L., Lyle to Bingen, 8072; near Underwood, 10969; White Salmon, 10967.

HELMINTHOSPORIUM POAE Baudys
On Poa secunda Presl, High Prairie (4).

HETEROSPORIUM AVENAE Oud. (LEAF MOLD).
The large-spored Heterosporium that occurs on necrotic leaves of overwintered wheat (Triticum aestivum L.) in the Goldendale Valley is referable to H. avenae Oud., 8002.

HETEROSPORIUM PHLEI Grey. (MAROON RING SPOT)
On Phleum pratense L., Bingen, 8095; High Prairie, 8195.

OVULARIA PULCHELLA (Ces.) Sacc. (GRAY LEAF SPOT).
On Bromus carinatus Hook. & Arn., near Celilo Falls, 8062.

RHYNCHOSPORIUM SECALIS (Oud.) J. J. Davis (LEAF SCORCH).
On Agropyron repens (L.) Beauv., 5 miles east of Bingen, 491.
Elymus condensatus Presl, near Celilo Falls, 8060.
E. glaucus Buckl., general in the Columbia Gorge, 8061, 8066.
Hordeum vulgare L., High Prairie, 8191, 8252.

SCOLECOTRICHUM GRAMINIS Fckl. (STREAK DISEASE).
On Agropyron repens (L.) Beauv., 4-1/2 miles east of Bingen, 769.
Arrenatherum elatius (L.) Mert. & Koch., White Salmon, 10970; 4 miles south of Guler, 8452; Guler, 8482.
Bromus carinatus Hook. & Arn., Goldendale Valley, 8314; Warick, 8190; Klickitat Canyon, 8122; Lyle 140; Bingen, 536; near Goldendale, 537.
Elymus condensatus Presl, 2 miles west of Centerville, 761.
Elymus glaucus Buckl., Maryhill, 8078; Klickitat Canyon, 8188.
Hordeum nodosum L., west of Lyle, 739.
Phleum pratense L., Trout Lake, 10973.
Poa ampla Merr., Klickitat Hills, 8164 (contains multiseptate spores).
Poa compressa L., Lyle, 8076; Wishram, 8106; Bingen, 8098; near Husum, 8248; High Prairie, 212; White Salmon, 224.
Sitanion jubatum J. G. Smith, general in eastern half of County, 8064; 10304; 8073; 8194; 8193; 10829; 531; 10975.
Stipa occidentalis Thurb., Satus Pass, 8375.
S. columbiana var. nelsonii (Scribn.) Hitch., between Lyle and Bingen.

BASIDIOMYCETES

USTILAGINALES

Suksdorf and later Zundel collected a number of smuts from Klickitat County which have been listed by Zundel in his report (11). The writer and, recently, Fischer have added several others.

ENTYLOMA IRREGULARE Johan.

While very common and sometimes destructive on Poa pratensis L. in Oregon this leaf smut is relatively rare in Klickitat County. Found once at water trough between Lyle and Bingen, 8072. Det. by Zundel.

Entyloma sp. very prevalent in one location along shore of Columbia River west of Bingen in earliest spring on Poa vaseyochloa Scribn., 8079. Sent to Zundel.

TILLETIA GUYOTIANA Har. (BROME COVERED SMUT).

On Bromus mollis L., High Prairie, 8171, 8310, 8311; Warick. (Fischer's Collections)

B. racemosus L., Goldendale, (Zundel and Cooney); near Goldendale, (Zundel); White Salmon, (Zundel); Stakers Canyon, (Zundel).

TILLETIA FOETIDA (Wal.) Liro (Tilletia levis Kühn) (SMOOTH-SPORED STINKING SMUT).

Reported.

TILLETIA CARIES (DC.) Tul. (Tilletia tritici (Bjerk.) Wint.) (ROUGH SPORED STINKING SMUT).

On Triticum aestivum L., general, 702, 8184, 8186, 8192.

T. dicoccum Schrank, High Prairie (Specimen sent to Pullman, Wash.).

UROCYSTIS AGROPYRI (Preuss.) Schroet. (LEAF SMUT).

On unknown grass, Bingen, Suksdorf, 464.

UROCYSTIS TRITICI Körn. (FLAG SMUT).

On Triticum aestivum L., Heald, Holton and Ternahan collected material of this in fields near Goldendale and 5 miles east of there in August 1940, and it was again found in 1941.

USTILAGO AVENAE (Corda) Jens.

On Arrhenatherum elatius (L.) Mert. & Koch, Troutlake, (Zundel); High Prairie, 10088.

USTILAGO CRUS-GALLI Tr. and Earle (SMUT).

On Echinochloa crusgalli (L.) Beauv., Bingen, Suksdorf 404, 3677

USTILAGO BULLATA Berk. (LOOSE BROME SMUT)
On Bromus carinatus Hook. and Arn., "Columbia River", Suksdorf 66; Bingen, 232.
B. mollis L., High Prairie, 8187.
B. racemosus L., White Salmon, (Zundel).
B. tectorum L., general, 8163, 8172.

USTILAGO ECHINATA Schroet. (SMUT).
On Phalaris arundinacea L., Bingen, Suksdorf 413.

USTILAGO HYPODYTES (Schl.) Fr.
On Stipa sp., Falcon Valley, Suksdorf 606 a.

USTILAGO JENSENII Rostr. (U. hordei (Pers.) K. & S.) (COVERED BARLEY SMUT).
On Hordeum vulgare L., common on High Prairie, 8165.
H. distichon L., common in one field in 1929 on High Prairie.

USTILAGO KOLLERI Wille (Ustilago levis (Kell. & Sw.) Magn.) (COVERED (OAT SMUT).
On Avena sativa L., High Prairie, 8183.

USTILAGO MULFORDIANA Ell. & Ev. (FESCUE SMUT).
On Festuca octoflora Walt., Bingen, Suksdorf 555.
F. reflexa Buckl., Bingen, Suksdorf 804.

USTILAGO SITANII Fisher (LOOSE SMUT).
On Elymus glaucus Buckl., (Fischer's collections) 10832.
Sitanion hanseni (Scribn.) J. G. Smith, without locality, Fischer June 15, 1937.
S. jubatum J. G. Smith, Warick, 10921; 757; 8383.

USTILAGO STRIAEFORMIS (West.) Niessl
On Phleum pratense L., Bingen, Suksdorf 532; High Prairie, 233.

USTILAGO TRITICI (Pers.) Rostr. (LOOSE SMUT).
On Triticum aestivum L. Seen in plots on High Prairie in 1932 from seed grown in the eastern United States.

UREDINALES

Suksdorf also collected a number of grass rusts which are listed in Hotson's paper (1). Further collection will no doubt add a large number to this list. During the years 1929 to 1940 rusts were not particularly abundant in Klickitat County.

PUCCINIA CORONATA Cda. (CROWN RUST).
On Holcus lanatus L., Bingen, 8089, 8153, 507, 8083, 8084; White Salmon, 210, 508.

PUCCINIA GLUMARUM (Schmidt) Erikss. & Henn. (STRIPE RUST).
On Bromus mollis L., High Prairie, 7527.
Elymus glaucus Buckl., Bingen, 8100.
Hordeum jubatum L., High Prairie, 7526.
Triticum aestivum L., High Prairie, 8307.

PUCCINIA GRAMINIS Pers. (STEM RUST).
On Triticum aestivum L., Falcon Valley, Suksdorf, 399.

PUCCINIA GRAMINIS PHLEI-PRATENSIS (Erikss. & Henn.) Stak. & Piem.
On Phleum pratense L., near Wishram, 8104; Bingen, 8099.

PUCCINIA PATTERSONIANA Arth.

The aecial stage of this rust usually is common on Brodiaea douglasii Wats. growing in oak thickets in the Klickitat Hills. On account of the early, dry summers, the uredia and telia on Agropyron spp. and other grasses are relatively rare. In fact, the first known collection of this rust on Agropyron spicatum (Pursh.) Scribn. & Smith for the State of Washington was made in 1936. The precipitation during June was heavy and favorable for rust development and P. pattersoniana was common on A. spicatum (bluebunch wheat grass) in the Klickitat Hills between Lyle and Goldendale, 8174, 8175.

PUCCINIA PHRAGMITIS (Schum.) Körn.
On Phragmites communis Trin., one mile west of summit of Lyle Hill, Evergreen Highway, 8090 (with W. T. Lund).

PUCCINIA POAE-SUDETICAE (Westend.) Jørstad (BLUE GRASS RUST).
On Poa ampla Merr., old road to Goldendale, Klickitat Canyon, 8077.
P. compressa L., Wishram, 8103.
P. nervosa (Hook.) Vasey, Lyle, 8110, 8143.
P. pratensis L., Maryhill, 8152, 8067; Wishram, 8105, 8188; 5 miles north of Goldendale, 8124; near High Prairie, 8115; near Lyle, 8072; between Bingen and Lyle, 511; Bingen, 512.
P. vaseyochloa Scribn., upper Klickitat Creek, 8114.

PUCCINIA RUBIGO-VERA (DC.) Wint. (LEAF RUST).

In the experimental plots on High Prairie, traces of leaf rust have been seen on emmer and spelt but apparently no collections were made on these hosts. Leaf rust also occurs in moderate amounts on certain grasses and on wheat. Leaf rust sometimes occurs on winter wheat in the fall soon after emergence.

On Agropyron dasystachyum (Hook.) Scribn., Wishram, 266.
Agropyron spicatum (Pursh) Scribn. & Smith, Bingen, Suksdorf, 60; near Wishram, 172.
Agropyron sp., Bingen, Suksdorf, 531.
Bromus carinatus Hook. & Arn., Lyle to Bingen, 8120, 8151, Suksdorf, 587.
B. rigidus Roth, Lyle, 8121.

Bromus sp., Falcon Valley, Suksdorf, 33; Bingen, Suksdorf, 794.
Elymus glaucus Buckl., Lyle; Troutlake, Suksdorf, 792; Falcon Valley, Suksdorf, 994; Bingen, 8086, 8100; Suksdorf, 602; Wishram, 209; 8 miles northeast of Lyle, 8435.
Poa scabrella (Thurb.) Benth., Klickitat Canyon, 8112.
Secale cereale L., Bingen, Suksdorf, 553.
Triticum aestivum L., High Prairie, 8169, 8307, 8309.

PUCCINIA SCABER (Ell. & Ev.) Barth.
On Oryzopis hymenoides (Roem. & Schult.) Ricker, Wishram, 207.

UROMYCES MYSTICUS Arth.
On Hordeum nodosum L., Bingen, 8111.

HYMENIALES

RHIZOCTONIA SOLANI Kühn
On Poa pratensis L., Troutlake, 10965.
Triticum aestivum L., sometimes isolated from the roots; High Prairie.

MYCELIA STERILIA

SCLEROTIUM sp.

Small sclerotia, about the size and color of radish seeds, occurred on the bleached leaves of fall annual brome grasses (Bromus mollis L. and B. tectorum L.) on High Prairie in early spring 1936, 8158. They failed to germinate on potato dextrose agar.

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THE CEREAL DISEASE SITUATION IN KANSAS

C. O. Johnston

The early spring of 1942 has been marked by rather low temperatures and abundant rains, especially in the western half of the State. As late as the middle of May light frosts occurred in northwestern counties. Severe floods occurred in the Arkansas River valley and water was high in all western Kansas streams. In general this can be called a cool, wet spring favoring the development of such diseases as leaf rust and mildew but being unfavorable for stem rust.

There is every indication that another severe epiphytotic of leaf rust of wheat (Puccinia rubigo-vera tritici) is rapidly developing in the southern and central plains area. In Kansas heavy infection already has developed as far north as Manhattan along the eastern edge of the area of large wheat acreages, which extends approximately from Manhattan straight south to the Oklahoma line. East of that area leaf rust infection also is heavy but the acreage of wheat is unusually small owing to heavy rains at seeding time last fall. Leaf rust infection was heavy in south central Kansas before May 15 but has appeared in abundance in northern counties since that date. One alarming feature of the situation is the fact that uredial development already has reached the flag leaves although much of the wheat is just beginning to head. Heavy rust infection on upper leaves before flowering nearly always results in considerable reduction in yield. Considerable apprehension is felt for the large acreage of late wheat in the western half of the State where about 65% of the 1942 Kansas wheat crop is located. Abundant rains have resulted in unusually heavy topgrowth in that area.

Besides leaf rust there is considerable mildew (Erysiphe graminis tritici) on wheat in some localities but not so much as in 1941. Speckled leaf blotch (Septoria tritici) is abundant in the central part of the State and is severe in southeastern counties. A black leaf spotting, apparently caused by a species of Helminthosporium, also is abundant in some fields in central Kansas.

Leaf rust of rye (Puccinia rubigo-vera secalis) is the heaviest the writer ever has observed. There is a considerable acreage of rye in the eastern half of the State and practically all fields were heavily infected by May 1. This rust overwintered in abundance.

Leaf rust of barley has been observed on winter barley at Manhattan but so far no infection has been seen on spring-seeded barley. Mildew (Erysiphe graminis hordei) is very heavy on susceptible varieties of barle

To this date no natural infections of stem rust on any cereal crop and no crown rust of oats has been seen by the writer or reported from any

location in Kansas. Night temperatures in particular and average temperatures in general have been much too low for the development of those rusts. (DIVISION OF CEREAL CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY. May 22).

EARLY LEAF RUST DEVELOPMENT IN EASTERN NEBRASKA IN 1942

M. W. Felton

New leaf rust pustules on winter wheat were found near Lincoln on March 22 of this year. This is the earliest date reported for leaf rust infection on winter wheat at this station. The condition of these new infections indicated that some lesions had been mature some 10 days to 2 weeks earlier. Old uredinia in various degrees of preservation could be found where rank growth or clustered plants had protected lower leaves. New infection was limited to such places. At this time rust was readily found only in early planted fields where growth had been heavy the previous fall. It could rarely be found where the sparse development of late plantings had provided little protection. A heavy covering of snow during the periods of sub-zero temperatures permitted winter cereals at Lincoln to overwinter with an unusual amount of uninjured foliage. Conditions seemed favorable for an early leaf-rust epiphytotic.

However, cool, dry weather prevailing during the last week of March and the first 3 weeks of April discouraged new infection while wheat developed rapidly. The vigorous, heavy new growth soon smothered the lower leaves which bore the early infections. By mid-April leaf rust became difficult to find but occasional pustules still persisted.

More favorable conditions have existed during the last week of April and the first 3 weeks of May. Extended periods of cloudy weather with heavy rains and frequent showers have permitted a steady increase of leaf rust, although unusually low temperatures have prevented optimum development. Infection at present (May 23) is limited to lower leaves and is quite variable within fields. In general, however, the inoculum is adequate and the weather of the next few weeks will determine the severity of infection.

Meanwhile, early varieties were heading by May 15, and May 31 will see practically all fields of winter wheat headed out in southeastern Nebraska.
(UNIVERSITY OF NEBRASKA, COLLEGE OF AGRICULTURE. May 27).

STRAWBERRY SPRING DWARF SITUATION ON CAPE COD

O. C. Boyd

On May 12, several strawberry fields were examined in the Falmouth area of Cape Cod for appraisal of the spring dwarf [*Aphelenchoides fragariae*] situation, which was very similar to that for the corresponding season of 1941. Each year recently seems to present a decreasing number of diseased beds. Also, both last year and this spring, injury in affected

beds was somewhat less than in most previous years owing to the markedly decreasing intensity of the disease in the daughter plants away from the mother plants. In most diseased fields, only the mother plant was severely damaged, the first secondary plant less so, and the second and third daughter plants were fully or nearly normal in appearance and set of blossom buds. In both 1941 and 1942, the light damage was attributed, at least in part, to the unusually dry weather of the preceding summers when secondary plants were forming.

Indications point strongly to an easing up in the spring dwarf situation since more locally-grown and northern-grown nursery stock has replaced the customary southern stock. During the past 2 seasons, dwarf has not been observed in the bearing fields planted either directly from the local and northern nursery sources or from home-grown plants originating in such nurseries. This year, the only cases of dwarf observed were in fields planted either directly from stock grown in Maryland or from home-grown plants one year removed from Maryland plants.

Under the general supervision of County Agent Bertram Tomlinson, about 250,000 plants were grown on the Barnstable County Farm in 1940 and set out by Falmouth growers in 1941. This spring, twice that number of plants, grown on the same farm last year, were set out for the 1943 production. The growers appeared to be well pleased with the appearance of the one-year beds as well as the newly set beds planted from the county farm nursery stock.

Demonstration plantings, conducted in cooperation with Dr. J. R. Christie of the U. S. Nematology Division, and terminating in 1941 indicated that the spring dwarf nematode does not survive in the soil on Cape Cod from the end of one season to the beginning of the next, and apparently that infected plants are the only source of the disease as it occurs on the Cape.

(MASSACHUSETTS STATE COLLEGE).

BRIEF NOTES ON PLANT DISEASES

INCREASE OF POTATO VIRUS DISEASES IN NEW HAMPSHIRE LAST YEAR: The summer of 1941 was the driest on record in New Hampshire for the past 71 years; as a result, the prevalence of plant diseases was different from normal. The increase of virus diseases in potatoes was particularly noticeable. In the southern part of the State where only table stock is grown, some fields of Green Mountains showed 10 to 15% net necrosis at digging time. Tubers from these and other fields stored until March and April showed from 50 to 80% net necrosis. The spread of leaf roll was also high in the seed-growing areas in fields where the plants were late in maturing. Certified seed coming into New Hampshire this spring from neighboring States contains as much as 50% net necrosis and 10 to 15% stem-end browning. As a result of the losses from net necrosis in Green Mountains this past year, many growers will plant varieties such as Houma, Katahdin, Sebago, and Sequoia for the first time. (M. C. Richards, New Hampshire Agricultural Experiment Station).

TOBACCO SEEDBED DISEASES IN MARYLAND: Tobacco blue mold [= downy mildew, Peronospora tabacina] was first observed on May 4 this year, in lower Calvert County, and appeared generally throughout the State by May 14. It is less destructive this year than usual owing partly to the extreme drought of the past 2 months. Rains occurred on May 21-23 in the upper tobacco counties and blue mold has injured many plant beds in Prince Georges and Anne Arundel Counties.

Tobacco anthracnose (Colletotrichum sp.), reported from Maryland in 1941 (PDR 25:411-414), was observed on May 7 in one College greenhouse where it was very destructive. On May 15 it was observed in plant beds in Price Georges County where 50% or more of the plants were killed. Anthracnose appears to be widespread in Maryland tobacco beds. Poorly drained beds appear to suffer more damage. The disease has been checked under greenhouse conditions by weekly applications of 2% Spergon. The red copper oxide-cotton seed oil emulsion spray used against blue mold appears not to be effective for anthracnose.

Tobacco wildfire [Phytomonas tabaci] has not been a problem this spring in Maryland tobacco plant beds. (E. A. Walker, University of Maryland. May 27).

WET WEATHER AND PLANT DISEASES IN NEW HAMPSHIRE THIS SPRING: The past 2 weeks (May 10-24) have been cloudy with frequent light rains; as a result, the fruiting of the cedar rusts has been very noticeable. Letters and specimens from all parts of the State have been received requesting information on identification and control. Most of the specimens received were identified as Gymnosporangium juniperi-virginianae; however, some specimens of G. clavipes on Juniperus communis have been received.

The wet cool weather caught most of the apples in central and southern New Hampshire in full bloom; as a result, a full bloom spray, in which a wettable sulfur without lead was used, was made this year on many farms. The weather, accompanied by heavy ascospore shooting, has been ideal for scab [Venturia inaequalis] infection.

Also, as a result of the wet weather, there has been severe defoliation of the white ash trees in and near Durham from Anthracnose (Gloeosporium aridum). (M. C. Richards, New Hampshire Agricultural Experiment Station. May 28).

APPLE SCAB IN MARYLAND: Apple scab spores were first observed to be mature and discharging on April 29 from leaves under Delicious apple trees in a small unsprayed block near College Park. Leaves from commercial orchards in the Rockville and Smithsburg vicinity examined May 22 were so affected by the drought during April and the first week of May that scab development was delayed. Perithecia were small and no ripe spores were found following 2 days of heavy rainfall. Many perithecia appeared to be undeveloped and void of contents, while others that were enlarging and contained asci in the banana stage should mature during the first week in June, or just after the second cover spray period. Perithecia appear to be abundant even though scab was not serious in commercial orchards last season. (E. A. Walker, University of Maryland. May 27).

ANNOUNCEMENT OF A NEW HANDBOOK OF VIRUS DISEASES OF STONE FRUITS

At a regional conference of investigators of stone fruit virus diseases held at East Lansing, Michigan in September 1941, a committee was appointed to bring together and publish under one cover information concerning all of the known virus diseases of stone fruits. This committee consisting of E. M. Hildebrand, chairman, G. H. Berkeley, and D. Cation has presented its report in the form of a publication entitled, "Handbook of Virus Diseases of Stone Fruits in North America."

This paper-bound, printed booklet of 76 pages treats a total of 56 virus diseases of stone fruits under their main hosts such as peach, sweet cherry, sour cherry, plum, almond, and apricot. The information on each disease is given under 16 arbitrary headings, namely, scientific name, synonyms, common names, geographic distribution, economic importance, host range, symptoms, strains, transmission, thermal relationships, immunologic relationships, unusual characteristics, control, remarks, investigators and contributors, and literature. Scientific names are given only as published elsewhere. In order to expedite publication in time for the 1942 season, illustrations were not attempted in this first edition.

It is hoped that this handbook will serve as a useful guide to plant pathologists, pomologists, extension workers, nurserymen, and regulatory inspectors. The responsibility for publication was undertaken by Director V. R. Gardner of the Michigan Agricultural Experiment Station and the book is published as a Miscellaneous Publication of that station. A limited edition of 1000 copies is now available for the cost of printing at 35 cents per copy. Stamps, money orders or checks should accompany orders to Michigan Agricultural Experiment Station, East Lansing, Michigan.

THE PLANT DISEASE REPORTER

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IN THIS ISSUE

A DISEASE OF WHEAT NEWLY RECORDED FOR THIS COUNTY

YELLOW-SPOT DISEASE OF WHEAT IN NEW YORK STATE -- M. F. Barrus

During a survey made by the writer in June 1941 in central and western New York, an unusual leaf spot was observed in 35 of the 168 wheat fields examined, in amounts ranging from very slight in 1 field and slight in 7, to considerable in 16, abundant in 7, and very abundant in 4. The leaf spot was found in 19 of the 33 fields inspected in Seneca County and in fewer fields in Wayne, Ontario, Yates, Monroe, Livingston, Genesee, and Wyoming Counties. It was most commonly found near Canoga, Seneca County, where Yorkwin wheat is generally grown, but no other determination of affected varieties was made. The survey was started on June 12 but the disease was not observed until June 18. After that, it was found until June 26 when the survey ended. Most of the fields inspected on the 18th were in the milk, and those on the 26th in the soft-dough, stage. The loss in yield as a result of the disease was not determined but was probably small. This disease was also observed during a wheat survey made in 1940 and has probably affected wheat in the same localities for several years at least.

The spots are oval or elongated, mostly 1 mm. or less in width and somewhat longer, occasionally coalescing to make a larger spot, brown in color with a light-yellow border. The lesion extends completely through the leaf, with about the same size, shape, and color on both sides. These spots increase in size as the season advances to dead brown areas as large as 5 mm. in width and 10 mm. or more long, usually tapering at the ends. The larger spots often coalesce and, where near each other, the intervening tissue dies.

Specimens were taken from some of the fields and examined microscopically later. Spores of a species of _Helminthosporium_ were present, but scanty, on the larger spots of the specimens examined. As the lesions do not resemble those caused by species of _Helminthosporium_ ordinarily present on wheat in this State, specimens were sent to the Office of Mycology and Plant Disease Survey of the U. S. Department of Agriculture for determination. They were referred to Dr. A. G. Johnson who determined the causal fungus to be _Helminthosporium tritici-vulgaris_ Nisikado, not previously reported from this country, which has been described from Japan by Nisikado.[1] (New York State College of Agriculture).

HELMINTHOSPORIUM TRITICI-VULGARIS ON WHEAT IN MARYLAND -- A. G. Johnson

The leaf spot of wheat caused by _Helminthosporium tritici-vulgaris_ Nisik., reported from New York by Dr. M.F. Barrus, is occurring in considerable abundance in the winter wheat breeding nursery of the Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, at Beltsville, Maryland. In this nursery it is attacking many hybrids and strains that are resistant to leaf rust. In severity of attack, the disease seems to be causing somewhat more injury than leaf

1/ Nisikado, Yosikazu. Preliminary notes on yellow spot disease of wheat caused by _Helminthosporium tritici-vulgaris_ Nisikado. Ber. Ohara Inst. f. Landwirt. For. 4:103-109. 1929.

rust does on varieties susceptible to it. On the varieties that are especially susceptible to leaf rust, this rust is so abundant that there is but little leaf tissue left for H. tritici-vulgaris to invade, although in some cases the 2 fungi occur on the same leaves. There are some indications that certain of the wheat strains and hybrids may be resistant to both of these fungi. In a limited survey, it has been found that the disease is occurring to some extent also in commercial fields of winter wheat in Montgomery and Howard Counties, Maryland.

Indications are that the disease has been with us for some time and that it has been overlooked because of its resemblance to the leaf spot caused by Helminthosporium sativum Pamm., King, & Bakke. The leaf spots caused by H. tritici-vulgaris, particularly when they are small, have yellower margins and lighter brown centers than those caused by H. sativum. (Division of Cereal Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, June 15.)

REPORTS AND SPECIMENS REQUESTED -- The Plant Disease Survey is anxious to obtain as much information as possible this season regarding the distribution of Helminthosporium tritici-vulgaris in the United States. Collaborators and cooperators are requested to look for this disease on wheat described in the two preceding articles and to send reports of their findings to the Survey. The staff will be glad to examine and report on specimens, and collections for the herbarium will be appreciated.

NOTES ON DISEASES, DECAYS, AND DISORDERS OF TOBACCO IN PUERTO RICO DURING THE 1941-42[1] SEASON

H. H. Foster, M. Garcia Fortuño
and G. Irizarry Rubio[2]

No accurate and complete tobacco disease survey, such as is fundamental to and essential for the proper development of a disease control program has ever been made in Puerto Rico. Because of the topography of the tobacco districts such a survey would require miles of travel on horseback over mountainous trails. While a general survey of all the principal tobacco districts could be made by car with a minimum of walking to seed beds and fields adjoining or near the highways, the present lack of transportation facilities makes it improbable that in the relatively near future an extensive survey can be made during a single growing season. It is hoped that disease surveys can be gradually extended to include all of the principal tobacco districts.

The following is not a complete list of tobacco diseases in Puerto Rico. It includes diseases, decays, and abnormal types observed at the main station of the Tobacco Institute of Puerto Rico at Rio Piedras and

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1/ In Puerto Rico commercial tobacco seed beds are sown from September 1, through October. The leaf crop is usually harvested from January to March.

2/ Respectively: Pathologist-Geneticist, Assistant Geneticist-Pathologist, and Agronomist - Tobacco Institute of Puerto Rico.

the 2 sub-stations at Caguas and La Plata (see fig. 1), and during occasional field trips to some of the principal tobacco districts.

Tobacco Mosaic (*Marmor tabaci* var. *vulgare* Holmes.)-- Typical tobacco mosaic was observed at the Río Piedras, Caguas, and La Plata Stations and in every commercial field inspected. At the 3 stations scattered infection was observed, but in general was considered of minor importance. In addition mosaic was observed in tobacco fields in the Caguas, Cayey, Cidra, Comerío, and La Plata districts. The percentage of infection was estimated to vary from a fraction of 1% to a possible 50 to 75%. In the field with heaviest infection the grower reported that plants were set from a seed bed showing some mosaic symptoms at the time of transplanting. The maturity of the crop, in the respective districts, varied considerably from one section to another and the amount of damage varied with the stage of plant development at the time mosaic developed. In some fields both quality and quantity of tobacco was reduced by mosaic.

Tobacco Mosaic - Yellow Strains (Isolated from type strain) -- Cook (1) has stated that yellow mosaic occurs in Puerto Rico. Bright yellow spots on tobacco leaves infected with common tobacco mosaic have frequently been observed in commercial fields. Several yellow mosaic isolations were made from susceptible F_2 plants during the past season, by methods similar to those described by Jensen (3). In our mosaic-resistance breeding program an estimated 75,000 mosaic-susceptible F_2 plants were pulled from inoculated seed beds. A few of these plants appeared to be infected with a strain of yellow mosaic. Some leaves were almost completely yellow. All of the yellow strains isolated readily induced infection on susceptible varieties tested. At least one yellow strain induced definitely more severe symptoms, on certain tobacco varieties and on certain other host plants, than the parent strains of common tobacco mosaic. Some additional studies are now in progress.

"Mottle Virus" -- During the past season mottle infection was observed in experimental plots at the Río Piedras and Caguas Stations, but not at the La Plata Station. However, scattered mottle infection was observed in some commercial fields in the La Plata area, and in the Cayey, Cidra, and Comerío districts. Usually symptoms were observed only on an occasional plant. Since the mottle virus appears to be transmitted by the wiping method quite as readily as tobacco mosaic it is not known why more infection does not develop occasionally.

In a previous report (2) the writer (Foster) stated that in preliminary inoculation tests under greenhouse conditions no severe leaf malformation had been observed. In more extensive tests during the past year the commercial varieties Virginia No. 9 and Utuado X No. 1 have shown, in some experiments, slight to moderate leaf malformation, also definite stunting. It seems probable that temperature and light affect the amount and severity of symptom expression.

A small field plot, containing Virginia No. 9 and Utuado X No. 1, was inoculated with the mottle virus during the early stage of plant development. Under field conditions the infected plants appeared somewhat yellow and slightly stunted as compared with healthy plants in nearby plots

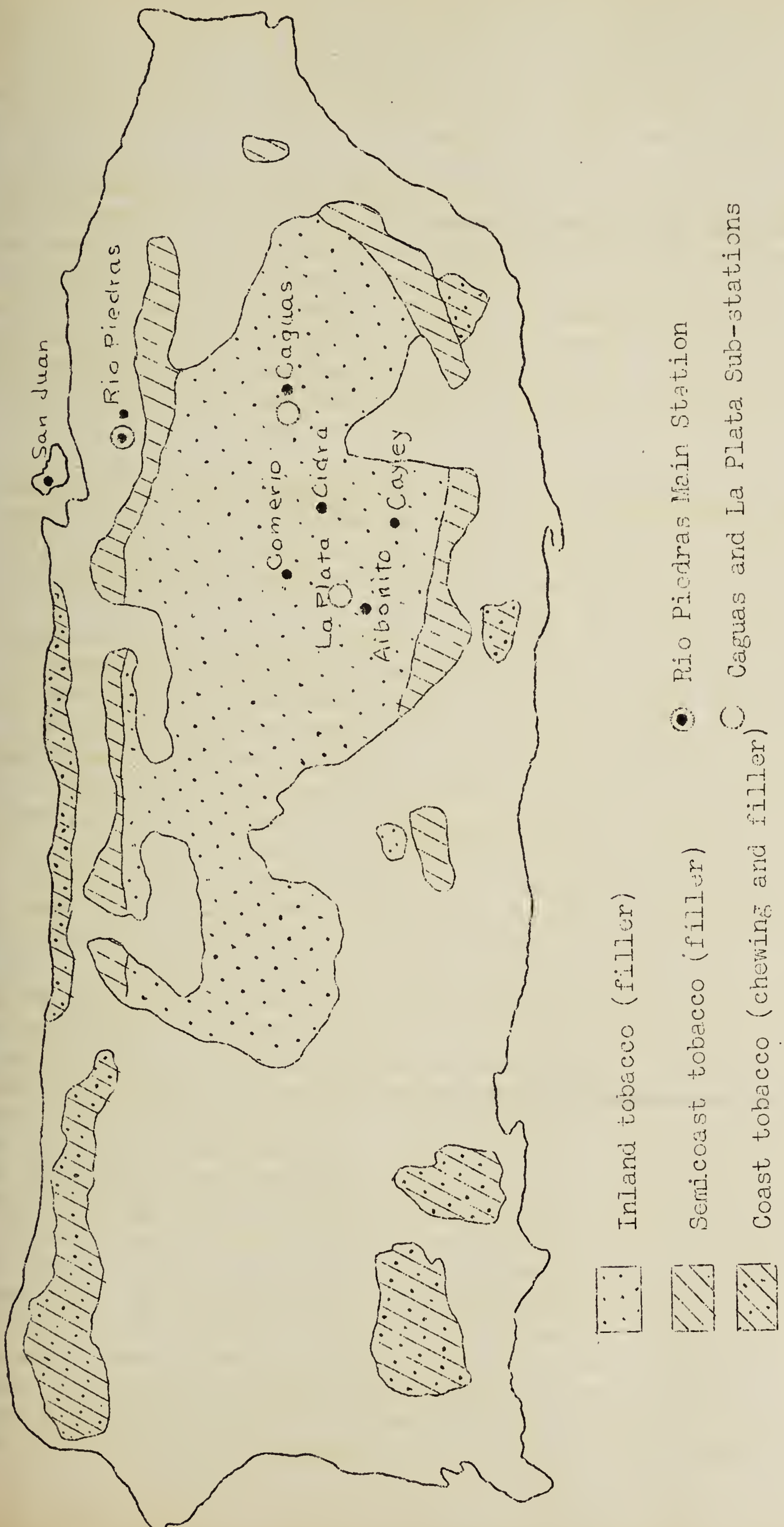

Figure 1. Puerto Rico Tobacco Growing Areas

(Map redrawn, in part, from U.S.D.A. Cir. No.519)

Some leaves from mottle-infected plants were collected, cured, and placed in fermentation with leaves from healthy plants. Following drying and during the early stage of fermentation leaves from infected plants appeared light in color and in weight, with a definite chaffy appearance. No definite conclusions can be drawn from this preliminary test but it does indicate that the mottle virus might be of considerable economic importance if infection should increase sufficiently.

Undetermined - (Virus ?) -- At the Caguas sub-station and in a few commercial fields an occasional severely stunted and malformed plant was observed. Severe curling and distortion of the leaf tissue, accompanied in some cases by necrotic spotting, was noted. Two such plants were transferred to the greenhouse at the Rio Piedras Station and preliminary inoculation tests were made using the wiping method both with and without carborundum powder. No symptoms developed on the inoculated plants. If this diseased condition was due to a virus then it would appear that the virus was not readily transmitted by the wiping method.

Phytophthora parasitica Dastur var. *nicotianae* Tucker. -- Black Shank or "pata prieta", though not the only soil-borne disease attacking tobacco in Puerto Rico, is undoubtedly one of the most important. The Tobacco Institute has given, and is continuing to give, considerable attention to the black shank problem.

Under Puerto Rican conditions black shank appears to be an important seed bed disease. From observations and preliminary experiments tobacco strains such as Florida Rg. and Puerto Rico 53-A, highly resistant to black shank under field conditions, do not carry a high degree of resistance during the early seedling stage. In one greenhouse experiment in which small seedlings were transplanted to steam sterilized soil "seeded" with a pure culture of *Phytophthora*, the resistant lines, Rg. and 53-A, were infected and killed as rapidly as susceptible lines. Resistance appears to become effective approximately when plants are of size to transplant to the field. If later experiments verify results from previous preliminary tests, then present resistant lines such as Rg. and 53-A will not solve the black shank seed bed problem in Puerto Rico.

Field resistance to black shank appears to be more readily obtained. In preliminary experiments and later in a randomized block field experiment several lines out of 16 varieties or strains showed a high degree of resistance. In this experiment, basing calculations on identified number of black shank infected plants, there was no significant difference between highly resistant lines, such as Rg. and 53-A, and the commercial varieties Virginia No. 9 and Utuado X No. 1. This does not prove that these 2 commercial varieties are satisfactorily resistant but it does indicate the presence of some degree of resistance under field conditions, which is in line with general field observations.

During the past season black shank was observed in the field plots at the Rio Piedras, Caguas, and La Plata Stations. At the Rio Piedras main station, where a large number of varieties and strains were grown, severe black shank infection was observed on a number of varieties including most of the Turkish strains. Black shank infection of Virginia No. 9 and Utuado X No. 1 varied from an occasional plant to approximately 10%

and was observed in all the tobacco districts previously noted for mosaic. Where other tobacco varieties were grown black shank infection was often greater; in one field of "Nene Sola", a native selection, nearly 50% infection was noted.

Cercospora nicotianae Ell. & Ev. -- Cercospora leaf spot, commonly known as frog-eye, was reported from Puerto Rico by Nolla (4, p. 25-26) in 1932. From symptoms observed this past season it seems probable that several pathogens may induce leaf spotting on tobacco. However, typical frog-eye symptoms were observed in all the tobacco districts inspected, including our 3 tobacco stations. One tobacco grower in the Comerío area was forced to harvest his crop prematurely because severe leaf spotting had advanced to the upper leaves when lower or basal leaves were maturing. The quality of his crop was markedly reduced. This leaf spot infection was the most severe the writers have ever observed. Microscopical examination of some leaf spots collected at the Río Piedras Station showed numerous spores of the Cercospora type, giving additional proof that this pathogen is of primary importance.

Botrytis sp. -- During the past year, in the greenhouse, mature and dying leaves occasionally became enveloped by a gray mold similar to that illustrated by Wolf (5, p. 335-341), who has summarized the literature and described symptoms. This diseased condition was more frequently noted when plants were somewhat crowded. Microscopical examination of the fungus revealed abundant and typical Botrytis spores. This semi-parasitic condition was never serious and upon careful disposal of all old and mature leaves no additional gray mold was observed.

Stem Rot or Rib Rot (?) - Causal Agent undetermined. -- Nolla (4, pp. 26-27) has reported a damping-off in Puerto Rican tobacco barns that appears to be similar to the rib rot observed during the past season. Following a few days of semi-cloudy and rainy weather during the curing period, reports from the Caguas area stated that some tobacco leaves hanging in the curing barns or sheds had developed a rot primarily of the thick midrib and to a lesser extent of the secondary leaf veins. A sample of this rot was observed at the Caguas Sub-station, occurring on a few varieties producing leaves with especially large, thick midribs. This outbreak appeared to be due, at least in part, to unfavorable weather conditions and possibly, to some extent, to improper care and handling of the harvested leaves.

Root Knot of Tobacco - Heterodera marioni (Cornu) Goodey -- During the latter part of the field season rather general nematode infection was observed in one of the experimental plots at the Río Piedras Station. Infection though abundant, was only moderately severe and galls were small to medium in size.

Root knot of tobacco does not appear to be a serious or even common disease in Puerto Rico. This may be due, in part, to 2 factors: the heavy clay soil common to much of the tobacco areas, and one or more drought periods during which the upper soil becomes exceedingly dry.

Deficiency Diseases -- Nolla (4, p. 26) has mentioned the possibility of nitrogen and potash deficiency occurring in the Caguas and Cidra areas. From field observations during the past season nutritional diseases did not appear to be of major importance in any of the tobacco areas surveyed. However, an occasional field showed some plants suffering from nitrogen deficiency and some plants apparently affected by potash deficiency.

Disorders

Numerous non-infectious disorders of tobacco have been observed during the past season, in the greenhouse, seed bed, and field. Some of these disorders appear to be mutations. From conversation with some plant breeders of other crops in Puerto Rico, it is generally believed that mutations often occur more frequently under tropical conditions than in the temperate zone of the mainland.

Wolf (5, pp. 61-109) has brought together much of the literature dealing with these conditions and has described the more common and important malformations, monstrosities, and "off type" conditions. Some of the more common disorders observed will be briefly mentioned. A few are receiving additional study since there may be some relationship to our present breeding program.

Albinism -- A few tobacco seedlings were observed to carry this phenomenon. One Ambalema plant was particularly striking since occasional leaves were, in part, a creamy white color. This plant was potted and observed to maturity. The white leaf pattern did not occur on every leaf but continued rather frequently to the uppermost leaves. The color was always the same, a striking creamy white.

Forked and Trifid Tipped Leaves -- Leaves in which the midvein was branched, with 2 or 3 tips, were occasionally observed.

"Beaker Shaped Leaves" -- This phenomenon in which the entire leaf appeared cup-shaped was primarily observed in small seedlings. Later leaves appeared to develop normally and this condition was only occasionally observed in large seedlings or mature plants.

Absence of Growing Point -- Occasionally young tobacco seedlings were observed in which growth had prematurely terminated and the main stem ended in the uppermost leaf. A number of such abnormal plants were transplanted to the field plot for further observations. Whenever these plants survived a new growing point developed from the uppermost leaf or the tip of the original main stem.

Dwarfing and Multiple Branching -- In a few commercial fields a large number of dwarf type plants were observed. Frequently the main stem had ceased to develop as one main stalk, but had divided to form 2 or 3 branches with flower heads often developing at the height of 2 or 3 feet. These plants did not appear stunted or dwarfed because of lack of nutrients, but appeared to be mutations or off-type plants.

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(DIVISION OF PATHOLOGY AND GENETICS, TOBACCO INSTITUTE OF PUERTO RICO, RÍO PIEDRAS, P.R.).

ADDITIONS TO THE HOST INDEX OF FUNGI OF MOUNT SHASTA, CALIFORNIA - II

W. B. Cooke

The following list will supplement 2 previous lists published in the Plant Disease Reporter (Suppl. 123, Oct. 1, 1940; 25 (2): 61-62. Feb.1, 1941). Some of this material has been checked by authorities listed in the first list.

Material cited as Leptosphaeria juncicola Karst. in the first list should be corrected to L. junciseda Karst.

The following citations are based on collections made during the summer of 1941, as well as, in some instances, material collected during 1937, 1938, 1939, and 1940. This list will bring the entire number up to 338 records of 251 species of fungi found to date on Mount Shasta. A few of these records were made outside the geographic area described as Mount Shasta proper, that is, the area above 4000 feet; however, the extra-limital records were made in or in the vicinity of Mount Shasta City (formerly Sisson, 3550 ft.) and mostly on hosts that occur above 4000 feet.

In addition to the regular depositories of these specimens: the Herbaria of the University of California and the University of Cincinnati, and the Mycological Collections, Division of Mycology and Disease Survey, Bureau of Plant Industry; duplicates of many will be placed at the New York Botanical Garden Herbarium and the Farlow Herbarium. Certain species will be represented in the next fascicle of the writer's exsiccati "Mycobiota of North America."

ABIES CONCOLOR Lindl. & Gord.
Cryptoporus volvatus (Pk.) Hubbard
Dasyscypha arida (Phil.) Sacc.
Echinodontium tinctorium Ell. & Ev.
Fomes pinicola (Sw.) Cke.
Guepiniopsis alpinus (Tracy & Earle) Brasfield
Polyporus abietinus Fr.
Polyporus leucospongia Cke. & Harkn.

ABIES MAGNIFICA var. SHASTENSIS Lemmon
Fomes officinalis (Fr.) Lloyd
Fomes pinicola (Sw.) Cke.
Lasiosphaeria vermicularia (Nees) Cke.
Lenzites sepiaria (Wulf.) Fr.
Trichosphaeria solaris (Cke. & Ell.) Ell. & Ev.

AGOSERIS GRANDIFLORA (Nutt.) Greene
Puccinia hieracii (Schum.) Mart.

AGROSTIS THURBERIANA Hitchc.
Hendersonia sp.
Leptosphaeria microscopica Karst.
Pleospora herbarum (Pers.) Rab.

AGROSTIS SP.
Cladosporium herbarum (Pers.) Lk.
Leptosphaeria microscopica Karst.
Leptosphaeria vagans Karst.
Mycosphaerella tulasnei Jacz.

ANEMONE OCCIDENTALIS Wats.
Pleospora permunda (Cke.) Sacc.
Scelobelonium melanosporum (Rehm) Höhn.

ARABIS PLATYSPERMA Gray
Pleospora permunda (Cke.) Sacc.

ARCTOSTAPHYLOS NEVADENSIS Gray
Aleurodiscus sp.
Cryptostictis arbuti (Bonar) Zeller
Gloniella lapponica Karst.

ARCTOSTAPHYLOS PATULA Greene
Polyporus leucospongia Cke. & Harkn.

ARNICA VISCOSA Gray
Leptosphaeria doliolum (Pers.) Ces. & DeNot.
Pleospora anthyllidis Auersw.
Pleospora herbarum (Pers.) Rab.
Titaea sp.

ASTER SHASTENSIS Gray
Coleosporium solidaginis (Schw.) Thüm.
Heteropatella alpina (Ell. & Ev.) WBC
Pyrenophora hispida (Niessl) Sacc.
Septoria sp.

BRICKELLIA GRANDIFLORA (Hook.) Nutt.
Puccinia subdecora Syd. & Holw.

BROMUS TECTORUM L.
Ustilago bromivora (Tul.) Fisch.

CALOCHORTUS NUDUS Wats.
Puccinia calochortii Pk.

CAREX KELLOGGII W. Boott.
Puccinia caricis (Schum.) Schroet.

CAREX SPECTABILIS DEWEY
Pleospora elynae (Rab.) Ces. & DeNot.

CAREX SP.
Hendersonia distans Brun.
Leptosphaeria vagans Karst.

CASTILLEJA MINIATA Dougl.
Heteropatella alpina (Ell. & Ev.) WBC
Typhula sp.

CASTILLEJA PINETORUM Fern.
Pleospora permunda (Cke.) Sacc.
Pyrenophora fenestrata Pk.

CEANOTHUS VELUTINUS Dougl.
Hymenochaete tabacina (Sow.) Lév.

CHRYSOTHAMNUS BLOOMERI var. ANGUSTATUS Gray
Teichospora megastega Ell. & Ev.

CRATAEGUS DOUGLASII Lindl.
Gymnosporangium libocedri (P.Henn.) Kern

CYCLADENIA HUMILIS Benth.
Pleospora permunda (Cke.) Sacc.

EUPATORIUM OCCIDENTALIS Hook.
Pleospora herbarum (Pers.) Rab.

FRITILLARIA ATROPURPUREA Nutt.
Phyllosticta sp.

ELYMUS GLAUCUS Buckl.
Puccinia glumarum (Schmidt) Erikss. & Henn.
Scolecotrichum graminis (Pers.) Fckl.
Selenophoma donacis (Pass.) Sprague & Johnson var.
Urocystis agropyri (Preuss.) Schroet.

GODETIA QUADRIVULNERA (Dougl.) Spach.
Puccinia vagans (DC.) Arth.

HOLCUS LANATUS L.
Puccinia rubigo-vera (DC.) Wint. (with Darluca filum (Biv.) Cast.)

HYPERICUM FORMOSUM var. SCOULERI Coulter
Uromyces hyperici (Spreng.) Curt.

JUNCUS BALTICUS var. MONTANUS Engelm.
Cladosporium herbarum (Pers.) Lk.
Leptosphaeria caricinella Karst.
Leptosphaeria junciseda Karst.
Leptosphaeria sp.
Lophium sp.
Mycosphaerella tulasnei Jacz.
Pyrenophora trichostoma (Fr.) Fckl.

JUNCUS ORTHOPHYLLUS Coville
Cladosporium herbarum (Pers.) Lk.
Leptosphaeria culmorum Auersw.
Leptosphaeria junciseda Karst.
Leptosphaeria michotii (West.) Sacc.

JUNCUS PARRYI Engelm.
Aposphaeria mollis (Lév.) Sacc.
Duplicaria acuminata Ell. & Ev.
Metasphaeria sepalorum Vleugel

LATHYRUS LANSZWERTII var. ARIDUS (Bradsh.) Jeps.
Macrosporium puccinioides Ell. & Anderson
Uromyces fabae (Pers.) DBy. (with Darluca filum (Biv.) Cast.)

LIGUSTICUM GRAYI C. & R.
Pleospora permunda (Cke.) Sacc.
Pleospora sp.
Synchytrium aureum Schroet.

LINUM MICRANTHUM Gray
Melampsora lini (Pers.) Lév.

LUPINUS ALBICAULIS var. SHASTENSIS C. P. Smith
Pleospora balsamorhizae Tracy & Earle
Pleospora gigaspora Karst.

LUPINUS OBTUSILOBUS Heller
Leptosphaeria sp.
Mycosphaerella aquilegiae Ell. & Galw.
Pleospora amplispora Ell. & Ev.
Pleospora gigaspora Karst.
Rhynchostoma exasperans Karst.
Septoriella sp.

OXYRIA DIGYNA (L.) Hill
Puccinia oxyriae Fckl.

PEDICULARIS DENSIFLORA Benth.
    Ramularia obducens Thüm.

PENTSTEMON GRACILENTUS Gray
    Heteropatella alpina (Ell. & Ev.) WBC
    Scelobelonium melanosporum (Rehm) Höhn.

PENTSTEMON MENZIESII var. DAVIDSONII (Greene) Piper
    Puccinia palmeri Diet. & Holw.

PHLEUM ALPINUM L.
    Cladosporium herbarum (Pers.) Lk.
    Leptosphaeria vagans Karst.
    Mycosphaerella tulasnei Jacz.

PINUS LAMBERTIANA Dougl.
    Fomes officinalis (Fr.) Lloyd

PINUS PONDEROSA Dougl.
    Dacrymyces deliquescens (Bull.) DBy.

POA PRATENSIS L.
    Ascochyta sp.
    Dendryphium sp.
    Puccinia poae-sudeticae (Westend.) Jørstad

POTENTILLA GRACILIS spp. NUTTALLII (Lehm.) Keck
    Phragmidium ivesiae Syd.

PRUNUS DEMISSA (Nutt.) Dietr.
    Septoria pruni Ell.
    Taphrina confusa (Atk.) Giesenhag.

PRUNUS EMARGINATA (Dougl.) Walp.
    Polyporus elegans (Bull.) Fr.

PUCCINIA RUBIGO-VERA (DC.) Wint.
    Darluca filum (Biv.) Cast.

SITANION HANSENII (Scribn.) J. G. Smith
    Puccinia pattersoniana Arth.
    Scolecotrichum graminis (Pers.) Fckl.
    Selenophoma donacis (Pass.) Sprague & Johnson var.

SITANION HYSTRIX (Nutt.) J. G. Smith
    Selenophoma donacis (Pass.) Sprague & Johnson var.

STEPHANOMERIA LACTUCINA Gray
    Puccinia harknessii Vize

TRISETUM SPICATUM (L.) Richt.
Cladosporium herbarum (Pers.) Lk.
Leptosphaeria microscopica Karst.
Leptosphaeria vagans Karst.
Mycosphaerella tulasnei Jacz.

TRITELIA IXIOIDES var. ANALINA (Greene) Hoover
Heterosporium allii Ell. & Martin

TSUGA MERTENSIANA (Bong.) Sarg.
Herpotrichia nigra Hart.
Polyporus leucospongia Cke. & Harkn.

VICIA CALIFORNICA Greene
Uromyces fabae (Pers.) DBy.

UROMYCES FABAE (Pers.) DBy.
Darluca filum (Biv.) Cast.

ON CHAPARRAL STICKS:
Polyporus elegans (Bull.) Fr.

ON GRASS, AGROSTIS, JUNCUS AND OTHER DEBRIS:
Scelobelonium melanosporum (Rehm) Höhn.
Typhula sp.

ON, AND HYPOGAEUS UNDER, DUFF AND HUMUS:
Abstoma reticulatum
Agaricus arvensis Fr.
Amanitopsis vaginata Fr.
*Arcangeliella lactarioides Zeller
Astraeus hygrometricus (Pers.) Morg.
Boletus albidus Rocques ssp. eupachypus Konrad
Boletus frustosus Snell
Boletus miniato-olivaceus Frost
Bovista pila B. & C.
Calvatia sculpta Hark.
Cortinarius cotaneus Fr.
Crucibulum vulgare Tul.
*Dendrogaster elasmomycetoides Zeller
*Elasmomyces echinosporus Z. & D.
*Endogone lactiflua Berk
*Gautieria monticola Harkn.
Hygrophorus vernalis A.J.Smith
*Hymenogaster remyi Z. & D.
Hypholoma fasciculare Fr.
*Hysterangium phillipsii Harkn.
*Hysterangium separabile Zeller
*Macowanites magnus Parks
*Melanogaster variegatus (Vitt.) Tul.
Montagnites sp.

Paxillus panuoides Fr.
*Rhizopogon brunescens Zeller
*Rhizopogon exiguus Zeller
*Rhizopogon provincialis Tul.
Secotium longipes Zeller
Secotium pingue Zeller
Secotium polytrichoides Zeller
Sedecula pulvinata Zeller
Tulostoma tuberculatum White

The rich hypogaeus (*) mycobiota of the higher elevations of Mount Shasta indicates the possibility of similar conditions in high elevations throughout North America. Field workers would do well to investigate this condition farther.

Species listed as "sp." were collected in either meager amounts, or are being published as new species, or are being studied more carefully by experts.

BRIEF NOTES ON PLANT DISEASES

CONTROL OF SILVERTOP OF FESCUE BY BURNING: Studies on commercial seed production of Festuca rubra fallax by the Department of Agronomy at this station revealed the fact that silvertop was increasing to the extent of being a limiting factor. In 1941 preliminary control measures were undertaken by Dr. C. C. Wernham of the Botany Department. Check rows of a replicated fertilizer plot were treated as follows: lethane-derris dust, sulfur dust, burning, and combinations of these dusts with and without burning. Burning was done as soon as the grass dried in the spring and before spring growth appeared. The dusts were applied on burned and unburned rows at later intervals. Results showed clearly that treatment of single rows was worthless owing to spread of the disease from adjacent rows. However, where 4 rows were burned or dusted, the burning gave marked control of the disease. The yield was below normal, but unburned rows were so severely affected that harvesting for yield data was abandoned. The season was unusually dry and it was difficult to judge whether the subnormal yield on the burned 4 rows was due to injury by burning, dry weather, or both.

At this point the problem was turned over to the writer as a doctorate thesis. This spring several treatments including burning were again applied. The Department of Agronomy burned complete replicates in another experimental plot which showed 1 to 2% silvertop last year. The season has been unusually moist and seed production plentiful. Of the treatments tried, burning in the spring just previous to or at the time of new leaf growth has given outstanding results and commercial control of silvertop. More complete data will appear in a later publication. It was thought advisable, in view of commercial seed shortage, to release this information at this time in order that autumn plantings for seed production need not be curtailed because of the threat of silvertop.

I am indebted to Professor Thornton of Agronomy and Doctor Wernham of this department for much help and advice. (Harry L. Keil, Graduate Stipend Scholar, Department of Botany, Pennsylvania State College).

WHEAT LEAF RUST IN SOUTH DAKOTA: Leaf rust [Puccinia rubigo-vera tritici] of wheat was collected at Highmore on May 27. The U.S.D.A. spring wheat rust nursery was at the 5-leaf stage and leaf rust occurred on all the varieties except Triticum timopheevi. This is an unusually early occurrence of leaf rust on spring wheat in central South Dakota, and antedates the occurrence of leaf rust on spring wheat at Brookings in 1941 by at least one week. A few pustules were found at Brookings this morning. Wheat plantings were early but growth in May was slow. The last week has been favorable for rust infection. (W. F. Buchholtz, South Dakota Agricultural Experiment Station, June 1).

A WOOD-DESTROYING FUNGUS ON GUM TIES AT JACKSONVILLE, FLORIDA: During the early part of March 1942 in a treating yard in Jacksonville, a large number of red or sweet gum [Liquidambar], tupelo [Nyssa], and black gum [Nyssa] ties were severely attacked by a wood-destroying fungus that appeared very suddenly and apparently in large quantities. The fungus proved to be Stereum rugosiusculum Berk. Great sheets of the fruiting bodies as well as shelf-like structures appeared on the ends of the ties apparently over night. In addition to this wood-destroying fungus, the ends and sides were covered with the molds that are usually to be found on gum ties in warm and rainy weather but that do not destroy the wood fibres.

The oldest of these ties were cut about the middle of December 1941 and were shipped into a well kept yard and piled according to the usual railroad standards within a week or 10 days after cutting. Thus, the ties were sap green when they arrived on the yard. During the latter part of December, January, and February there was almost continual rainfall in the southeastern United States, and the ties had little opportunity to dry. Many of them had 100% water in the interior. To all intents and purposes the ties looked all right on Thursday, March 12, except for the black molds. However, on Monday morning, March 16, the fruiting bodies appeared in large numbers on the tie piles of greatest age, that is, the December-cut ties. It rained during the early part of the week, but the weather cleared about March 19, and from then on the appearance of the sporophores became less and less. In order to meet this situation it was decided to treat all of the ties immediately. Before treatment both ends of each tie were sawed off at the adzing machine and those showing decay were thrown aside. At the end of 2 weeks all of the affected tie piles had been disposed of by treatment, and no fungus has appeared since that time.

One of the interesting factors connected with this sudden epidemic is that 100 miles or so north of Jacksonville, where similar ties were piled, there was no sign of the Stereum or of decay. (Hermann von Schrenk, Chesapeake & Ohio Railway Co., St. Louis, Missouri, May 11).

RUST ON SAPODILLA IN FLORIDA: The sapodilla or chicle tree (Achras zapota L.) is cultivated to a limited extent in Southern Florida as an ornamental and for its highly esteemed fruit. The tree has been practically free of fungous diseases in this locality up to the present time.

In January 1942 a rust was observed producing red to purplish red spots on the leaves of many seedling sapodilla trees growing in a windbreak row on the grounds of the Sub-Tropical Experiment Station near Homestead, Florida. The rust was tentatively identified as Uredo sapotae Arthur and Johnston, a species apparently not heretofore reported from the mainland of the United States. Specimens were sent to the Florida Agricultural Experiment Station's herbarium at Gainesville, where Mr. Erdman West identified them as Uredo sapotae. Previous reports on this species give its range as the Bahamas, Cuba, and the Dominican Republic.

Considerable variation in susceptibility to rust infection occurs on the seedling sapodilla trees growing at the Station. Some are practically free of rust infection while others develop rust pustules on nearly all the mature leaves. Even in the latter cases, however, the disease appears to be of minor importance, since the rust infection does not seem to cause serious defoliation. (George D. Ruehle, Sub-Tropical Experiment Station, Homestead, Florida).

VARIOUS PLANT DISEASES OBSERVED IN PENNSYLVANIA: Yesterday I finished a survey of barley fields, in Lebanon, Cumberland, Franklin, Mifflin, Juniata, and Perry Counties. In most counties where seed treatment has been carried on yearly for the last 5 or 6 years, it is almost impossible to find covered smut [Ustilago hordei] in barley fields. There was only a trace of loose smut [U. nuda, etc.]. In fact I found the least amount of smut this year that I have ever found since coming to Pennsylvania.

In Adams County on June 2 I was called to a canning factory to inspect tomato seedlings. In about an acre about 45 to 50% of the plants had the leaf stage of alternaria canker [A. solani]. The excessive rain has done a great deal of damage to the tomato industry. Only about 1/2 to 2/3 of the plants are in the field and many of them have been damaged by the rain. Even if it clears up at once it will be a week to 10 days before people can get into the field to finish planting.

Yesterday I saw $36 worth of southern-grown tomato plants that had been in the hands of the farmer for 10 days. Part of the time they were in baskets, but now they are heeled in and the tops look as if a fire had gone through them.

In Adams County I have found 3 conditions in cherry orchards that seem to be distinct virus diseases. One is a yellowing of the leaves that looks like cherry yellows. These yellow-leaved trees are scattered through cherry orchards all over the county. Under the trees the leaves have fallen as they would in autumn. (George L. Zundel, Pennsylvania State College, June 5).

CHECK LIST REVISION

Freeman Weiss

ROSMARINUS (LABIATAE)

ROSMARINUS OFFICINALIS L., ROSEMARY. Evergreen subshrub of Mediterranean region, cult. for aromatic foliage and oil, also as a hedge plant; Zone VI.

Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz.

ROYSTONEA (PALMACEAE)

ROYSTONEA spp., especially R. REGIA (H.B.K.) C.F.Cook (R. floridana C.F.Cook), CUBA ROYAL PALM. Columnar feather palm of tropical America, planted for ornament and as a street tree in S.Fla.; also R. BORINQUENA C.F.Cook PUERTO RICO ROYAL PALM, used for construction and ornament in P.R. Juvenile forms are grown as conservatory plants.

Alternaria sp., leaf spot. Fla.
Colletotrichum gloeosporioides Penz., anthracnose, peticle spot. Fla., Texas.
Diplodia sp., leaf spot. Fla.
Epicoccum neglectum Desm., leaf spot. Fla.
Graphiola phoenicis (Moug.) Poit., flase smut. Fla.
Helminthosporium sp., leaf stripe. Fla.
Heterodera marioni (Cornu) Goodey, root knot. Fla.
Melanconium sabal Cke., on leaf stalks. Fla.
Meliola denticulata Wint., black mildew. P.R.
Nectria cinnabarina Tode ex Fr., on bark. Fla.
Ophiobolus verisporus Ell. & Mart., on leaf stalks. Fla.
Pestalotia palmarum Cke., leaf spot. P.R.
Phytophthora palmivora Butler, wilt. Fla.
Little leaf, cause unknown. Fla.

RUBUS (ROSACEAE)

RUBUS spp., BLACKBERRIES. (1) Cult. biennial cane types, deciduous. Derived chiefly from the following native spp. ranging from New England to the Southern and Central States: R. ALLEGHENIENSIS Porter, ALLEGHANY B., R. ARGUTUS Lk. (R. ostryifolius Rydb.), HIGHBUSH B., and R. FRONDOSUS Bigel., YANKEE B., together with other closely related forms and hybrids between them and other Rubus spp.; cult. Zones III & IV.

Apioporthe vepris (T. de Lacroix) Wehmeyer, on twigs. Va., W.Va.
Armillaria mellea Vahl ex Fr., root rot. Texas, Wash.

RUBUS spp., BLACKBERRIES -- continued.

Asterella rubi (Fckl.) Höhn., on canes. Va.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on canes. Ala.

Botrytis cinerea Pers., gray mold of fruit, occasionally bud & shoot blight. General, especially in the Pacific Northwest.

Cephaleuros virescens Kze., algal leaf spot, green scurf. Fla.

Cercospora rubi Sacc. (C. bliti Tharp, C. septorioides Ell. & Ev., ? C. rubicola Thüm.) Conidial stage of Mycosphaerella confusa.

Cercosporella rubi (Wint.) Plakidas (Fusisporium rubi Wint., Ramularia r. (Wint.) Wr.), rosette, double blossom. N.Y. to Fla., Texas & Ill.

Cladosporium sp., fruit mold. Wash.

Coniothyrium fuckelii Sacc. Conidial stage of Leptosphaeria coniothyrium.

Corticium galactinum (Fr.) Burt, white root rot. Ark., Md., Va.

Cylindrosporium rubi Ell. & Morg., leaf spot. N.Car., Texas (? Septoria rubi).

Didymella applanata (Niessl) Sacc., spur blight. Va., Wis.

Discosia artocreas Tode ex Fr., on leaves. Ala.

Elsinoë veneta (Burkh.) Jenkins (Gloeosporium venetum Speg.), anthracnose. General.

Gloeodes pomigena (Schw.) Colby, sooty blotch. Md. to N.Car. & Ind.; Texas.

Gloeosporium venetum Speg. Conidial stage of Elsinoë veneta.

G. rufomaculans (Berk.) Thüm. (G. rubi Ell. & Ev.) Conidial stage of Glomerella cingulata.

Glomerella cingulata (Ston.) Spauld. & Schrenk., on canes, ? canker. Md., Va.

Gnomonia rubi Rehm, ? cane blight. Me., N.Y., Pa., Vt.

Gymnoconia peckiana (Howe) Trott., orange rust (O,I,III). The microcyclic form, Kunkelia nitens, is reported to be more common than this on blackberries and to range farther south and perhaps west. Collections assigned to this sp. but only in part confirmed by germination tests indicate its occurrence on wild and cult. blackberries throughout the N.E. and N. Central States to Ga., Ill. & Minn.; also in the Western States to the Pacific Coast.

Hendersonia platypus Ell. & Ev., on twigs. Ill.

Hypoderma virgultorum (Pers. ex Fr.) DC., on canes. N.Car., Va.

Kuehneola uredinis (Lk.) Arth., yellow-rust, cane rust (O,I,II,III). Me. to Fla., La. & Wis.

Kunkelia nitens (Schw.) Arth., orange rust (I). General, but probably more common in the Southern, and possibly the Western States, than the demicyclic form. On cult. and wild blackberries, often perennial.

Leptosphaeria coniothyrium (Fckl.) Sacc., cane blight. N.Y. to N. Car. Texas & Wis.; Pacific Northwest.

Leptothyrium pomi (Mont. & Fr.) Sacc. (? Microthyriella rubi Petr.), fly speck (on canes & leaves). Pa. to N.Car. & Ill.

Lophodermium rubiicolum Earle, on canes. Ala., Ga.

RUBUS spp., BLACKBERRIES -- continued.

Mycosphaerella confusa Wolf (Cercospora rubi Sacc.), leaf spot, blotch. Va. to Fla. & Texas; Ill., Ind.

M. rubi Roark (Septoria rubi Westend.), leaf spot. Reports under this name, usually of the imperfect stage, have been received from nearly all the States, but possibly some confusion with S. brevispora has occurred. M. rubi in the ascigerous stage does not occur or is rare in the Pacific Northwest. A similar fungus, known only as Sphaerella ligea Sacc., occurs on Rubus in Oregon. Cylindrosporium rubi Ell. & Morg., on leaves, and Rhabdospora rubi Ell., on canes, also appear to belong to this group, but their specific identity has not been established.

(M. rubina (Pk.) Jacz.): Didymella applanata.

Peronospora rubi Rabh., downy mildew. Md., Wis.

Pezicula rubi (Lib.) Niessl, on dead canes. N.J., N.Y., N.Car., Pa., Tenn.

Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot, fruit rot. Ohio, Md., Va.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.

Phyllosticta spp. (P. allegheniensis Tehon & Stout, P. ruborum Sacc., P. villosa Ell. & Ev., a nom. nud.), leaf spot. Fla., Ill., N.H., N.Car., W.Va. Probably spermatial stage of Mycosphaerella spp.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Physalospora obtusa (Schw.) Cke., on canes. Ga.

P. rhodina (Berk. & Curt.) Cke. (Diplodia natalensis Pole-Evans), on canes. Ala.

Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. General.

Rhabdospora rubi Ell., on canes. Del., N.J. (? Septoria rubi).

Rhizoctonia solani Kühn, root & collar rot. Colo.

Septoria rubi Sacc., leaf spot. N.E. States to N.Car. and probably other Southern States, west to the Pacific Coast. Conidial stage of Mycosphaerella rubi.

Sphaerotheca humuli (DC.) Burr., powdery mildew. Conn. to Md., Ill. & Minn.; Pacific Northwest.

Stigmatea rubicola (Ell. & Ev.) Theiss., on leaves. N.J., N.Y., Pa.

Valsa ceratophora Tul., on canes. N.Y., Pa., Va.

Verticillium alboatrum Reinke & Berth., wilt. Calif., Minn., N.Y., Wash.

Dwarf, Rubus virus 5 Zeller ex Smith (Nanus loganobacci Holmes). Oregon.

Leaf curl, Rubus virus 3A Bennett ex Smith (Corium rubi Holmes var. beta Holmes). Mich.

Mosaic, one or more viruses, including Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes) and Rubus virus 2 Bennett ex Smith. Mass. to Va., Iowa & Wis.; Pacific Northwest.

Streak, Rubus virus 4 Wilcox ex Smith (Nanus orientalis Holmes). Ohio, Pa., Wash.

RUBUS spp., BLACKBERRIES (2) Cult., perennial cane types, mostly evergreen. Of European origin but locally naturalized in some of the Eastern and the Pacific Coast States, especially R. LACINIATUS (West.) Willd., CUTLEAF B., and

RUBUS spp., BLACKBERRIES (2) -- continued.
also R. PROCERUS P. J. Meul, HIMALAYA B., and R. ULMIFOLIUS Schott. var. INERMIS (Willd.) Focke, EVERGREEN THORNLESS B.; cult. Zone V. A few records apply also to R. FRUTICOSUS L., EUROPEAN B., and related types, rarely cult. here.

Ascospora ruborum Zeller (Hendersonia rubi (Westend.) Sacc.), cane spot. Wash.
Botrytis cinerea Pers., fruit rot, shoot blight. Pacific Coast States.
Coniothyrium fuckelii Sacc., cane blight. Oregon.
(Coryneum ruborum Oud.): Hendersonia rubi.
Elsinoë veneta (Burkh.) Jenkins, anthracnose. Oregon, Wash.
Gnomonia rubi Rehm, ? cane blight. Md.
Hapalosphaeria deformans Syd., stamen blight, dry berry. Oregon, Wash.
Hendersonia rubi (Westend.) Sacc. Conidial stage of Ascospora ruborum.
Kuehneola uredinis (Lk.) Arth., yellow rust. Pacific Coast States.
Mycosphaerella confusa Wolf (Cercospora rubi Sacc.), leaf spot, blotch. Ala., N.J., N.Car.
M. rubi Roark (Septoria rubi Westend.), leaf spot. Calif.
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf spot, canker. Va.
Phomopsis sp., canker. Wash.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. General.
Septoria brevispora (Sacc.) Zeller, leaf spot. Md.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Oregon.
Dwarf, Rubus virus 5 Zeller ex Smith (Nanus loganobacci Holmes). Pacific Coast States.
Mosaic, undet. virus (? Rubus viruses 1 or 2, Marmor rubi Holmes). Idaho, Oregon.
Red berry, caused by feeding of mites (Eriophyes gracilis Nal.) Calif.

RUBUS spp., BLACKBERRIES (3) Native spp., chiefly those not sources of cult. vars., as R. CANADENSIS L., THORNLESS B. of New England to Ga. & Minn., and R. CUNEIFOLIUS Pursh, SAND B. of the Eastern Coastal Plain from Conn. to Fla.

Cercosporella rubi (Wint.) Plakidas, rosette. Ill., N.Car.
Corticium microsclerotia Weber, web blight. Fla.
Gloeosporium papulatum Dearn., on leaves. Tenn.
Gymnoconia peckiana (Howe) Trott., orange rust (O,I,III). Me. to Tenn. & Minn.
Kuehneola uredinis (Lk.) Arth., yellow rust (O,I,II,III). Me. to Fla., Ala. & Wis.
Kunkelia nitens (Schw.) Arth., orange rust (I). Me. to Fla., La. & Minn.
Mycosphaerella confusa Wolf (Cercospora rubi Sacc.) leaf spot, blotch. Ala., Md., N.J., W.Va.
M. rubi Roark (Septoria rubi Westend.), leaf spot. Conn. to N.Car., La. & Mich.
Peronospora rubi Wallr., downy mildew. Md.
Pezicula rubi (Lib.) Niessl, on canes. N.H., Tenn.

RUBUS spp., BLACKBERRIES (3) -- continued.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Minn., Pa., Wash.
Stigmatea rubicola (Ell. & Ev.) Theiss., on leaves. N.Y., Pa., Wis.

RUBUS spp., DEWBERRIES. (1) Eastern types derived from R. FLAGELLARIS Willd., NORTHERN D., or the closely related spp. R. BAILEYANUS Britt. and R. ENSLENII Trott. (regarded as only forms of the sp. by some authors), occurring from New England to the Great Lakes and Gulf States, cult. Zone III; and in part from R. TRIVIALIS Michx., SOUTHERN D., occurring from Va. to Fla. & Texas, cult. Zone VI; also from hybrids with other Rubus spp.

Apioporthe vepris (T. de Lacroix) Wehmeyer, on stems. N.Car.
Botrytis cinerea Pers., gray mold of fruit. N.Car.
Cercosporella rubi (Wint.) Plakidas, rosette, double blossom. N.Y. to Ala., Ill. & Texas.
Collybia dryophila Fr., root rot. N.Car.
Corticium galactinum (Fr.) Burt, root rot. Md., Va.
Elsinoë veneta (Burkh.) Jenkins, anthracnose. General.
Gloeodes pomigena (Schw.) Colby, sooty blotch. N.Car., Pa.
Glomerella cingulata (Ston.) Spauld. & Shrenk, canker, fruit rot. Ga., Ill., Md., Miss.
Gnomonia rostellata (Fr.) Wehmeyer, on stems. N.Car.
Gymnoconia peckiana (Howe) Trott., orange rust (O,I,III). Me. to Va., Mo. & Minn., possibly south and west. (Some vars. are highly resistant or immune, e.g. Lucretia).
Helicobasidium purpureum (Tul.) Pat., violet root rot. N.Car., Texas.
Hypoderma virgultorum (Pers. ex Fr.) DC., on stems. N.Y., W.Va.
Irenina sanguinea (Ell. & Ev.) F.L.Stevens, black mildew, leaf spot. Ala., La.
Kuehneola uredinis (Lk.) Arth., yellow rust. Me. to Fla., Texas & Kans.
Kunkelia nitens (Schw.) Arth., orange rust (I). Conn. to Fla., Texas & Iowa.
Leptosphaeria coniothyrium (Fckl.) Sacc., cane blight, dieback. N.J. to Ala. & Texas.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck. N.Car.
Mainsia epiphylla (Arth.) Jacks., rust (II,III). On R. trivialis, Texas.
Monochaetia desmazierii Sacc., on stems. N.Car., Tenn., Va.
Mycosphaerella confusa Wolf (Cercospora rubi Sacc.), leaf spot, blotch. N.J. to Fla., Texas & Ill.
M. rubi Roark (Septoria rubi Westend.), leaf spot. General.
Peronospora potentillae DBy., downy mildew. Conn., Ill.
P. rubi Rabh., Fla., Md., Wash., Wis.
Pezicula rubi (Lib.) Niessl, on stems. N.J., N.Y., W.Va.
Pezizella oenotherae (Cke. & Ell.) Sacc., leaf & cane spot, fruit rot. Md. to N.Car.
Phomopsis sp. and P. rubiseda Fairman, on twigs. N.Y.

RUBUS spp., DEWBERRIES (1) -- continued.

Phyllosticta dispergens Tehon, leaf spot. Ill.
P. ruborum Sacc., Miss., N.Y.
Phyllostictina carpogena Shear, fruit rot. Md., N.J., N.Y., N.Car.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on stems. Ala., Me., W.Va.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Conn., Fla., N.Car., Ohio.
(Rhizoctonia crocorum (Pers.) DC.): Helicobasidium purpureum.
Septoria darrowii Zeller, leaf spot. N.Y.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Ill., Minn., Pa., Ohio, Idaho.
Synchytrium aureum Schroet., yellow leaf gall. Wis.
Verticillium albo-atrum Reinke & Berth., wilt. Calif.
Leaf curl, Rubus virus 3A Bennett ex Smith (Corium rubi var. beta Holmes). Mich., Ohio.
Mosaic, Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes), Conn., Mich., N.J., N.Y.; also Rubus virus 2 Bennett ex Smith, Mich., N.Y.

RUBUS spp., DEWBERRIES (2) Western types derived from R. URSINUS Cham. & Schlecht., CALIFORNIA D., and especially its var. VITIFOLIUS (Cham. & Schlecht.) Focke, GRAPELEAF D., occurring in Calif. & Oregon, cult. Zone V. Forms of the latter, perhaps influenced by hybridity, have been given distinctive names as R. loganobaccus Bailey, loganberry, and R. titanus Bailey, mammoth blackberry. A few records on R. MACROPETALUS Hook., TRAILING BLACKBERRY, occurring from Idaho to Wash. & Calif. are included.

Armillaria mellea Vahl ex Fr., root rot. Oregon.
Ascospora ruborum Zeller (Hendersonia rubi (Westend.) Sacc.), cane spot. Ala., Calif.
Cercosporella rubi (Wint.) Plakidas, rosette, double blossom. La., Miss.
Didymella applanata (Niessl) Sacc., spur blight. Oregon, Wash.
Elsinoë veneta (Burkh.) Jenkins (Gloeosporium venetum Speg.), anthracnose. General.
Gnomonia rubi Rehm, on canes. Oregon.
Gymnoconia peckiana (Howe) Trott., orange rust (O,I,III). Va.
Hapalosphaeria deformans Syd., dry berry, stamen blight. Oregon, Wash.
Kuehneola uredinis (Lk.) Arth., yellow rust (O,I,II,III). Calif.
Kunkelia nitens (Schw.) Arth., orange rust (I). Calif., Oregon, Va.
Leptosphaeria coniothyrium (Fckl.) Sacc., cane blight. General.
L. thomasiana Sacc. & Roum., cane blight. Oregon, Wash.
Mycosphaerella confusa Wolf (Cercospora rubi Sacc.), leaf spot. Ga., Miss.
M. rubi Roark (Septoria rubi Westend.), leaf spot, sometimes canker & dieback. General.
Peronospora rubi Wallr., downy mildew. Wash.

RUBUS spp., DEWBERRIES (2)

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. General.
Pyrenopeziza rubi (Fr.) Rehm, on canes. Calif.
Rhizoctonia solani Kühn, collar rot. Wash.
Sphaerotheca humuli (DC.) Burr., powdery mildew. Pacific Northwest.
Septoria darrowii Zeller, leaf spot. Md.
(S. rubi Westend.): Mycosphaerella rubi.
Verticillium albo-atrum Reinke & Berth., wilt. Calif., N.Y.
Dwarf, Rubus virus 5 Zeller ex Smith (Nanus loganobacci Holmes). Oregon, Wash.
Mosaic, undet. virus (? Rubus virus 1 Rankin & Hockey ex Smith, Marmor rubi Holmes). Calif. & Pacific Northwest.

RUBUS spp., RASPBERRIES (1) red. Cult. red raspberries derive chiefly from R. IDAEUS L. var. STRIGOSUS (Michx.) Maxim., AMERICAN RED R., which occurs from New England to Va. and the Rocky Mts. north to Alaska; the EUROPEAN RASPBERRY, R. I. var. VULGATUS Arrhen., is represented in the ancestry of some vars. and occurs rarely as an escape; the var. ACULEATISSIMUS Reg. & Tiling., WESTERN RED R., occurs in the western part of this range; cult. Zone III.

Alternaria sp., fruit rot. Mass., N.Y.
Armillaria mellea Vahl ex Fr., root rot. Oregon, Wash.
Ascospora ruborum Zeller (Hendersonia rubi (Westend.) Sacc.), cane spot, dieback. Mass., Oregon, Wash.
Botryosphaeria ribis var. chromogena Shear et al., on canes. Fla.
Botrytis cinerea Pers., gray mold of fruit, sometimes flower & shoot blight. Cosmopolitan.
Cercospora rubi Sacc. Conidial stage of Mycosphaerella confusa.
Cercosporella rubi (Wint.) Plakidas, double blossom, rosette. Ill., Md., N.Y., Pa.
Clypeosphaeria hendersonia (Ell.) Sacc., on dead canes. Mich., N.J., N.Y.
Coryneum microstictum Berk. & Br., on canes. Me. (Ascospora ruborum ?).
Cuscuta gronovii Willd., dodder. Conn., Ill., Wis.
Cylindrosporium rubi Ell. & Morg. (? Septoria rubi Westend.), leaf spot. Pa. to Texas & Wis.
Cytospora sp. and C. rubi Schw., on dead stems. Idaho, N.J., Oregon, Pa.
Didymella applanata (Niessl) Sacc., spur blight (gray bark). General.
Didymosphaeria manitobensis Ell. & Ev., on leaves. Mich.
Elsinoë veneta (Burkh.) Jenkins (Gloeosporium venetum Speg.), anthracnose. General (but less common on red than on black raspberries).
Gloeosporium allantosporum Fautr., anthracnose, dieback. Oregon, Wash.
(G. cingulatum Atk.): Glomerella cingulata.

RUBUS spp., RASPBERRIES (1) -- continued.

(G. rubicolum Ell. & Ev.): Glomerella rubicola.

(G. venetum Speg.): Elsinoë veneta.

Glomerella cingulata (Ston.) Spauld. & Schrenk, canker, dieback. Ark., Md., N.J., Ohio, R.I., W.Va.

G. rubicola (Ell. & Ev.) Spauld. & Schrenk, white bud, canker. Ill., N.J., W.Va.

Gnomonia depressula Karst., on dead canes. Alaska.

G. rostellata (Fr.) Wehmeyer, on stems. Iowa.

G. rubi Rehm. Oregon.

Graphium gracile Pk., on leaves. Ind., N.Y., Wis.

Gymnoconia peckiana (Howe) Trott., orange rust. Although sometimes reported on red raspberry (N.E. and Great Lakes States to Pacific Coast) these reports are not authenticated. There are no reports of the short-cycle rust, Kunkelia nitens, on this host.

Hypoderma virgultorum (Pers. ex Fr.) DC., on dead canes. Mass., N.H., Oregon.

Kuehneola uredinis (Lk.) Arth., yellow rust (O,I,II,III). Ill., Pa. (Not recorded on this host by Arthur).

Leptosphaeria coniothyrium (Fckl.) Sacc. (Coniothyrium fuckelii Sacc.), cane blight, leaf spot. General.

L. thomasiana Sacc. & Roum., cane blight. Oregon.

Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck. Mass., Ind., Ky.

Macrophoma rubi Tehon, canker. Ill.

Monochaetia desmazierii Sacc., on leaves. Alaska, Iowa.

Mycosphaerella confusa Wolf (Cercospora rubi Sacc.), leaf spot. Ga.

M. fructicum Starb., on leaves. Alaska.

M. rubi Roark (Septoria rubi Westend.), leaf spot, cane spot. General.

(M. rubina (Pk.) Jacz.): Didymella applanata.

Nectria cinnabarina Tode ex Fr., on canes. Alaska.

Pezicula rubi (Lib.) Niessl, on dead canes. Me., N.Y.

Pezizella oenotherae (Cke. & Ell.) Sacc., leaf & cane spot. Md., Mo., Va.

Phoma sp. (? P. idaei Cud., also reported as P. rubicola Brun.), on canes & spurs. Minn., N.Y. Conidial stage of Didymella applanata.

Phomopsis sp., on canes. Iowa.

Phragmidium rubi-idaei (DC.) Karst., leaf rust, also cane and Western rust (O,I,II,III). N.E. and N. Central States to Colo. and Pacific Northwest.

Phyllactinia corylea (Pers. ex Karst.) powdery mildew. Mich.

Phyllosticta sp. and P. bicolor Pk., on leaves. Fla., N.Y., Wash.

Phyllostictina carpogena Shear, fruit rot. Md.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Physalospora obtusa (Schw.) Cke., on dead canes, ?blight. Iowa, Md., Mich., Mo., N.Dak., Pa.

Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. General.

Pucciniastrum americanum (Farl.) Arth., late leaf rust (II,III). N.E. States to N.Car., Ill. & Idaho. O and I on Picea glauca.

RUBUS spp., RASPBERRIES (1) -- continued.

Pyrenopeziza rubi (Fr.) Rehm, on dead canes. Calif., N.Dak.

Rhabdospora rubi Ell. (? Septoria rubi Sacc.), cane spot. Ala., Ill., N.J., Pa., Alaska.

Rhizoctonia solani Kühn, root & collar rot. Colo., Idaho, Wash.

Rhizopus nigricans Ehr., black mold of fruit. Cosmopolitan.

Septoria darrowii Zeller, leaf spot. Md., N.Car., Wis.

(S. rubi Westend.): Mycosphaerella rubi.

(Sphaeropsis rubicola Cke. & Ell.): Physalospora obtusa.

Sphaerotheca humuli (DC.) Burr., powdery mildew. N.E. States to Ill. & Minn., Calif. & Pacific N.W.

Sphaerulina intermixta (Berk. & Br.) Sacc., on canes. Oregon.

Stigmatea rubicola (Ell. & Ev.) Theiss., black spot on canes & leaves. Mont., N.Mex., N.Y., Vt., Wis.

Valsa ambiens Pers. ex Fr., on dead canes. N.Y., N.Dak.

Verticillium albo-atrum Reinke & Berth., wilt. Oregon, N.Y.

Xylaria sp., root rot. Wash.

Chlorosis, -- mineral deficiency, usually of iron, associated with alkaline soil. Western States.

Leaf curl, Rubus viruses 3 and 3A Bennett ex Smith. (Corium rubi vars. alpha and beta Holmes). General. The red raspberry is a common host, with indistinguishable symptoms, for the two vars. of the virus.

Mosaic (green mosaic, red raspberry mosaic), Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes). General.

Yellow mosaic, Rubus virus 2 Bennett ex Smith. N.Y. to Md. & Wis., and probably in other raspberry districts. ("Yellows" applied to Rubus is an ambiguous term, not equivalent to yellow mosaic; probably a complex disease involving both types of mosaic and sometimes leaf curl.)

RUBUS spp., RASPBERRIES (2) black. Derived from R. OCCIDENTALIS L., BLACKCAP R., including the amber-fruited var. PALLIDUS Bailey, ranging from New England to Ga., Colo. and the Pacific Northwest; cult. Zone III. R. LEUCODERMIS Torr. & Gray, WHITEBARK R., occurring from Mont. to Utah, central Calif. and Wash., also has given rise to hort. vars. PURPLECANE RASPBERRIES are hybrids of R. occidentalis and red raspberries, R. neglectus Pk. is a naturally occurring hybrid of this nature.

Ascospora ruborum Zeller, cane spot, dieback. Oregon.

Cercosporella rubi (Wint.) Plakidas, double blossom. Ky.

Clypeosphaeria hendersonia (Ell.) Sacc., on dead canes. N.J., T.H.

Coleroa chaetomium (Kze.) Rabh. var. americana Petr., on leaves. Wash. (? Stigmatea rubicola.)

Cryptostictis ludibunda Vester., on stems. Va., Vt.

Cylindrosporium rubi Ell. & Morg. (? Septoria rubi Sacc.), leaf spot. Miss.

Didymella applanata (Niessl) Sacc., spur blight. Kans., Oregon, Pa., Wis.

RUBUS spp., RASPBERRIES (2) -- continued.

Didymosphaeria manitobensis Ell. & Ev., on leaves. Mont.

Elsinoë veneta (Burkh.) Jenkins (Gloeosporium venetum Speg.), anthracnose. N.E. States to Md., Kans. & Pacific Northwest.

? Erwinia amylovora (Burr.) Winslow et al., flower & twig blight. Pa.

Gloeosporium allantosporum Fautr., anthracnose. Oregon, Wash.

Glomerella cingulata (Ston.) Spauld. & Schrenk, canker, dieback. Ky., Mich., Mo., Ohio.

Gnomonia rubi Rehm, on dead canes. Oregon.

Gymnoconia peckiana (Howe) Trott., orange rust (O,I,III). N.E. States to La. & Minn.; Pacific Northwest.

Kuehneola uredinis (Lk.) Arth., yellow rust (O,I,II,III). Del. to Mo. & Wis. (Not recorded on this host by Arthur).

Kunkelia nitens (Schw.) Arth., orange rust (I). Ill., Ind., Mich., Ohio.

Leptosphaeria coniothyrium (Fckl.) Sacc., cane blight. N.H. to Ga., Kans. & Wis.; Oregon.

Macrophoma conica Pass., on canes. Va.

Mycosphaerella confusa Wolf (Cercospora rubi Sacc.), leaf spot. Ala., Fla., Ga.

M. rubi Roark (Septoria rubi Westend.), leaf spot. Vt. to S.Car., Ark. & Nebr.; Wash.

Peronospora rubi Rabh., downy mildew. Wash.

Pezizella oenotherae (Cke. & Ell.) Sacc., cane & leaf spot. Md., Ohio.

Phoma sp., cane blight. N.Y.

Phragmidium rubi-idaei (DC.) Karst., leaf rust, sometimes on stems (O,I,II,III). Calif., Mass., Oregon, Wis.

Phyllosticta rubicola Rabh., on leaves. Ind.

Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. General.

Pucciniastrum americanum (Farl.) Arth., late rust (II,III). N.E. States to Va., Iowa & N.Dak.

Pyrenopeziza rubi (Fr.) Rehm, on dead canes. Oregon.

Septoria darrowii Zeller, leaf spot. Md.

(S. rubi Westend.): Mycosphaerella rubi.

Sphaerotheca humuli (DC.) Burr., powdery mildew. Minn., N.Y., Ohio, Oregon.

Sphaerulina intermixta (Berk. & Br.) Sacc., on dead canes. Oregon.

Stigmatea rubicola (Ell. & Ev.) Theiss., black spot on canes & leaves. Md., Nebr., Wis.

Verticillium albo-atrum Reinke & Berth., wilt (Western bluestem). Mass. to N.J. & Ohio; Oregon, Wash.

Leaf curl, Rubus virus 3A Bennett ex Smith (Corium rubi var. beta Holmes). N.Y. to Pa., Ind. & Mich., and probably elsewhere.

Mosaic (mild mosaic), Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes). General.

Yellow mosaic, Rubus virus 2 Bennett ex Smith. Ill., Md., Mich., N.Y., Ohio, Pa., Wash.; probably general.

RUBUS spp., RASPBERRIES (2) -- continued.
Streak (Eastern bluestem, rosette), Rubus virus 4 Wilcox ex Smith (Nanus orientalis Holmes). Conn. to Md., Ill. & Wis.; Pacific Northwest. (A mild and a severe form have been described but are thought to be caused by only strains of one virus. The mild form causes "crumbly berries" sometimes reported as a distinct disease; the severe form causes necrotic streaking, dwarfing, and sometimes witches'-brooms.)

RUBUS spp., RASPBERRIES, (3) ORIENTAL, as R. ELLIPTICUS Sm., GOLDEN EVERGREEN R., R. HAWAIIENSIS Gray, R. PHOENICOLASIUS Maxim., WINEBERRY, and R. ROSAEFOLIUS Sm., ROSELEAF R.; cult. for fruit & ornament chiefly in the South and sometimes naturalized in the American tropics.

Corticium galactinum (Fr.) Burt, root rot. Md., Va.
Irene calostroma (Desm.) Höhn., black mildew. T.H.
Kuehneola uredinis (Lk.) Arth., yellow rust (O,I,II,III). T.H.
Leptosphaeria coniothyrium (Fckl.) Sacc., cane blight. Va.
Mycosphaerella rubi Roark (Septoria rubi Westend.), leaf spot. Md. (S. darrowii Zeller perhaps also present).
Phomopsis rubiseda Fairman, on canes. N.Y.
Stictis hawaiiensis Cash, on living stems. T.H.
Leaf curl, ? Rubus virus 3 Bennett ex Smith (Corium rubi Holmes). N.Y.
Mosaic, ? Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes). Oregon, Pa.

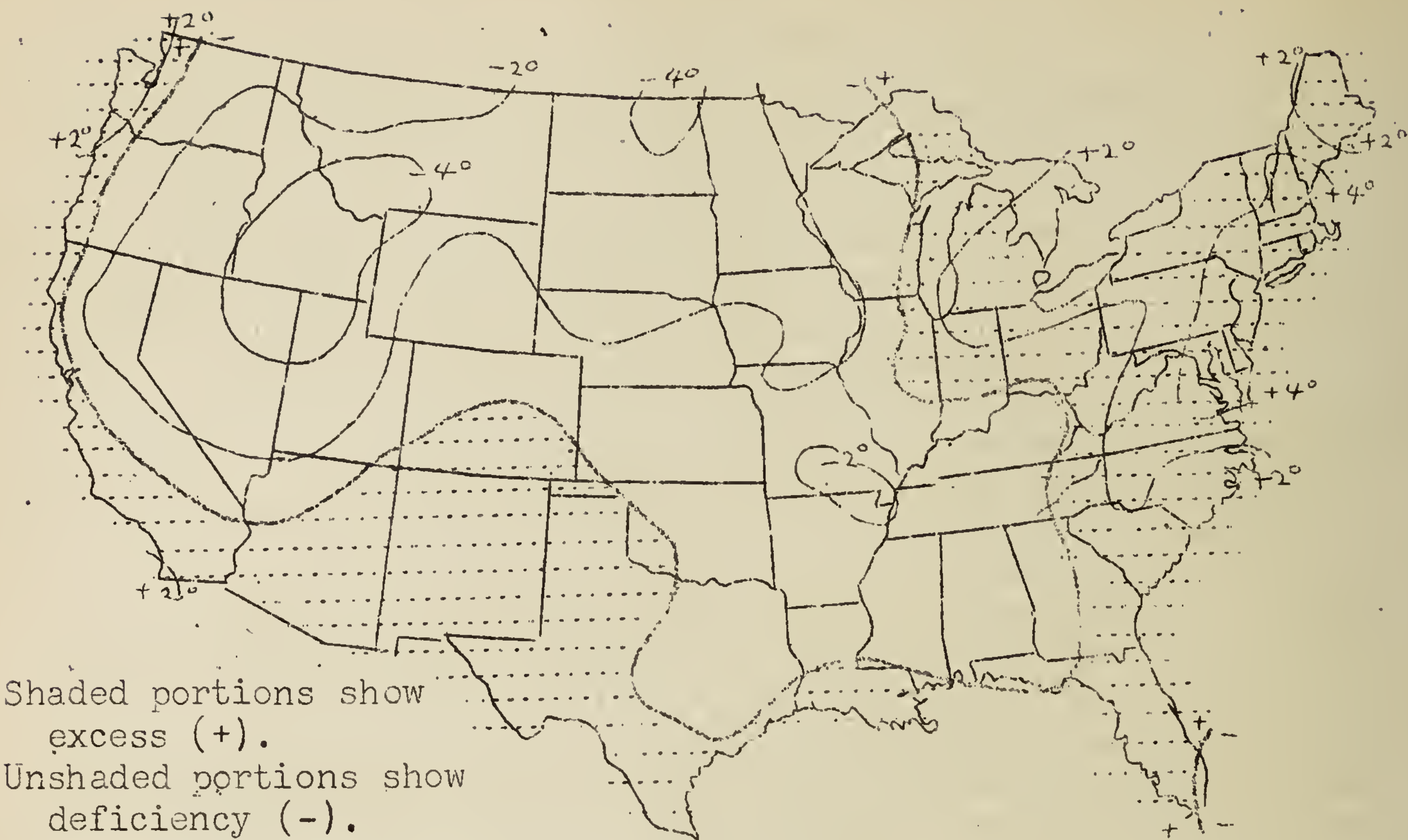
RUBUS spp., RASPBERRIES (4) flowering, as R. ODORATUS L., PURPLE FLOWERING R., FRAGRANT THIMBLEBERRY, In N.E. States to Ga. and Mich., cult. Zone III; and R. DELICIOSUS Torr., WHITE FLOWERING R., BOULDER R. in Colo. to Ariz. and N. Mex., cult. Zone V.

Gnomonia rostellata (Fr.) Wehmeyer, on canes. W.Va.
Leptothyrium pomi (Mont. & Fr.) Sacc., fly speck on canes. N.Y.
Leptosphaeria coniothyrium (Fckl.) Sacc., cane blight. Me., W.Va.
Monochaetia desmazierii Sacc., on leaves. Me.
Pezicula rubi (Lib.) Niessl, on dead canes. Va.
Phragmidium peckianum Arth., rust (O,I,II,III). On R. deliciosus, Mont. to Ariz. & N.Mex.
P. rubi-odorati Diet., rust (O,I,II,III). On R. odoratus, Me. to N.Car. & Mich.
Phomopsis rubiseda Fairman, on canes. N.Y.
Phyllosticta variabilis Pk., leaf spot. N.Y., Vt.
Physalospora obtusa (Schw.) Cke., on canes. N.Y.
Pyrenopeziza lacerata (Cke. & Pk.) Sacc., on dead canes. N.Y., W.Va.
Sphaerotheca humuli (DC.) Burr., powdery mildew. N.E. States to Va. & Ohio.
Leaf curl, ? Rubus virus 3A Bennett ex Smith (Corium rubi Holmes). N.Y.
Mosaic, ? Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes). N.Y.

RUBUS spp., THIMBLEBERRIES (and others). Spp. native to N. America, bearing edible fruit, sometimes grown for ground cover or ornament, not otherwise classified, as R. CHAMAEMORUS L., CLOUDBERRY, of northern New England to Alaska; R. parviflorus Nutt., WESTERN THIMBLEBERRY, ranging from the Great Lakes to Calif. and Alaska; R. PUBESENS Raf. (R. triflorus Richards), DWARF RED BLACKBERRY, New England to Alaska; R. SPECTABILIS Pursh, SALMONBERRY, northern Rocky Mts. to Calif. and Alaska.

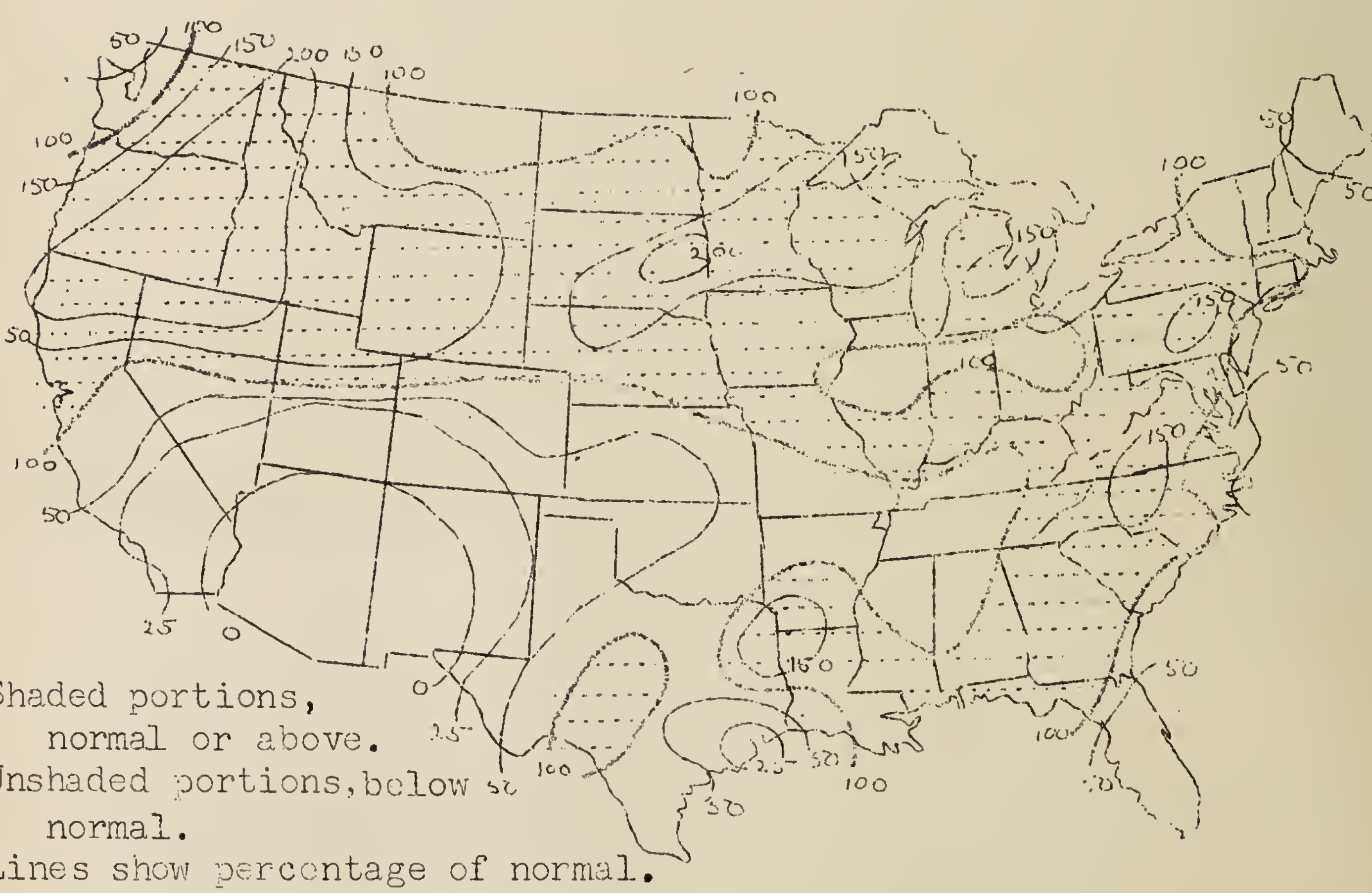
Aposphaeria major Syd., on stems. Utah.
Botrytis cinerea Pers., flower & shoot blight, gray mold of fruit. Alaska.
Coccomyces rubi (Fr.) Karst., on fallen leaves. Calif.
Gnomonia rostellata (Fr.) Wehmeyer, on dead stems. Calif.
Gymnoconia peckiana (Howe) Trott., orange rust (O,I,III). On R. pubescens. Me., N.H., Wis.
Hypoderma virgultorum (Pers. ex Fr.) DC., on dead stems. Alaska.
Kuehneola uredinis (Lk.) Arth., yellow rust (O,I,II,III). On R. pubescens, Mass., Mich., N.Y.
Kunkelia nitens (Schw.) Arth., orange rust (I). On R. parviflorus. Calif.; on R. pubescens, Va.
Leptosphaeria coniothyrium (Fckl.) Sacc., canker, blight. Mass., Va.
Leptothyrium clypeosphaerioides Sacc., on dead stems. Alaska.
Marssonina potentillae (Desm.) Magn. var. tormentillae Trail., leaf spot. Wis.
Mycosphaerella rubi Roark (Septoria rubi Westend.), leaf spot. On various spp., Wis. to Calif. & Alaska.
Nectria cinnabarina Tode ex Fr., on stems, coral spot. Alaska.
Phragmidium occidentale Arth., rust (O,I,II,III). On R. parviflorus, Mich. to N.Mex., Wash. & Alaska.
P. rubi-idaei (DC.) Karst., rust (O,I,II,III). On R. spectabilis, Oregon & Wash.
Phyllosticta dearnessii Sacc., on leaves of R. pubescens. N.Y.
Pucciniastrum arcticum (Lagerh.) Tranz., rust (II,III). On R. chamaemorus, Alaska; on R. pubescens, New England to Minn.
Pyrenopeziza rubi (Fr.) Rehm, on dead stems. Calif.
Synchytrium aureum Schroet., leaf gall. On R. pubescens. Wis.
Mosaic, ? Rubus virus 1 Rankin & Hockey ex Smith (Marmor rubi Holmes). Oregon.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).



Shaded portions show
excess (+).
Unshaded portions show
deficiency (-).
Lines show amount of excess or deficiency.

Figure 1. -- Departure of Mean Temperature from the Normal for May 1942.



Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Figure 2. -- Percentage of Normal Precipitation for May 1942.

MAY WEATHER

(U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for the week ending June 2, 1942).

Figure 1 shows that the temperature for May 1942, averaged approximately normal throughout the southern half of the country, with the monthly means ranging from 1° to 2° above. In the Northeast the month was considerably warmer than normal, but the Northwest and Great Basin had minus temperature departures of 3° to 5°. For the country as a whole the average was approximately normal.

Figure 2 shows that precipitation was very unevenly distributed geographically. The amounts were again heavy, ranging up to one-and-a-half to more than twice the normal, in most sections from the Lake region westward. They were substantially above normal in the East also, except the extreme Northeast and along the Atlantic coast. On the other hand a large southwestern area had very little precipitation. Marked contrasts may be seen in many nearby sections, such as New Jersey compared with northeastern Pennsylvania, southeastern with southwestern Virginia, northeastern with northwestern Florida, the coast sections with eastern interior Texas, southern with northern California, and western with eastern Washington.

1/3.

T H E   P L A N T   D I S E A S E   R E P O R T E R

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IN THIS ISSUE

TOMATO TIP-BLIGHT FOUND IN WEST VIRGINIA

J. G. Leach and Anthony Berg

In the spring of 1941 a destructive disease of tomato seedlings appeared in a greenhouse near Morgantown, West Virginia. It was first observed in flats of young plants grown for sale to local home gardeners, but it was observed also on field plants obtained from this greenhouse. The disease was characterized by necrotic spots on the leaves and elongated lesions on the stem, and young plants were killed within a few days. The disease was tentatively diagnosed as streak but when attempts to transmit it from tomato to tomato and from tomato to tobacco were unsuccessful, the correctness of the diagnosis was questioned. Because of the pressure of other work no further studies were made until it appeared again in 1942 in the same greenhouse. Further investigations identified the disease as tip-blight caused by a strain of the spotted wilt virus (Lethum anstraliense var. lethale) and transmitted by thrips.

The greenhouse in which the disease occurs is heavily infested with thrips (Thrips tabaci) and transmission experiments with the insect taken from diseased tomatoes have been uniformly successful, while thrips taken from beans in another greenhouse did not transmit the virus.

The disease was eventually transmitted in a very small percentage of trials by mechanical inoculation with the aid of fine carborundum, but all other methods of mechanical inoculation failed. The symptoms agree closely with those described by Milbrath and by Holmes.

What is apparently the same disease has been observed on young pepper plants and on a number of weeds infested with thrips and growing under the greenhouse benches. The disease has not been observed or reported elsewhere in the State. It is probable that tip-blight was introduced into this greenhouse on ornamental plants brought in from a distance. Many kinds of ornamentals are grown in the house and tomatoes are grown only for sale as transplants.

Because of the difficulty in completely controlling thrips and because of the wide range of hosts for both the thrips and the virus, the disease promises to be very difficult to control. The disease is so destructive that every effort must be made to prevent its further spread.

This is apparently the first report of tip-blight in the eastern part of the country, and the second definite determination of its occurrence outside of the Pacific Coast area, the only other record being from Texas. However, Milbrath stated that "a critical review of the literature suggests that tip-blight virus is widely distributed but not recognized" owing to confusion with the spotted wilt virus or to a mixture of the 2 viruses. According to him symptoms indicative of a mixture of both viruses had been described from Australia, California, and Texas, while a report of an "unusual occurrence" of spotted wilt in Utah was more typical of tip-blight (Phytopath. 29:166-167. 1939).

(WEST VIRGINIA UNIVERSITY).

LOOK FOR TOMATO TIP-BLIGHT

Just what is the distribution of tip-blight? The only definite records of occurrence are from Oregon, where the disease and the virus were first described (Milbrath, Phytopath. 29: 156-168. 1939); from Texas, where symptoms attributed by Young, Altstatt, and Harrison (PDR 22: 7. 1938) to spotted wilt suggested to Milbrath a mixture of tip-blight and spotted wilt; and now from West Virginia.

Milbrath's inference of possible occurrence in California, Utah, and Australia is mentioned in Leach and Berg's article above. The circumstances detailed in Blood's report of the Utah disease (PDR 20: 143-144. 1936) point to the seed as the source of infection, but neither the tip-blight nor the spotted-wilt virus is seed-transmitted, as far as known.

In Oregon, the tip-blight disease was at first thought to be due to the spotted wilt virus plus some other undetermined virus. Both viruses occurred together in some localities and sometimes both were found in the same plant, but the tip-blight virus in pure form predominated and made it possible to distinguish the symptoms from those of spotted wilt and to identify the virus as distinct. Since the spotted-wilt virus is ordinarily the only one to be recovered from doubly-infected plants, the effects of the mixture may be ascribed to this virus alone. As already mentioned, Milbrath suggests that this has probably happened more than once. The viruses of tip-blight and of spotted wilt are closely related and in many of their common hosts produce similar symptoms. The host range so far tested for tip-blight is similar to that of spotted wilt, and the vector is the same. Altogether, there may be difficulty in deciding whether tip-blight is the virus concerned in a particular case, even though it is present unmixed.

Milbrath describes the effects produced by the tip-blight virus in certain differential hosts of which tomato itself is one, which he says clearly distinguish this virus from all other tomato viruses. These symptoms are compared with those of spotted wilt and certain other virus diseases with which tip-blight might be confused. Streak is not one of these, but in view of the fact that the disease in West Virginia was at first thought to be streak, there is certainly a possibility that tip-blight may be hiding behind that name in less carefully investigated occurrences.

From his experience with tip-blight in West Virginia, Doctor Leach is impressed with the menace a widespread distribution of this virus would constitute to the tomato industry, and suggests that collaborators be asked to make a careful survey to determine where it actually does occur, as a basis for intelligent efforts to check further spread and establishment in new locations.

It should be borne in mind that danger from tip-blight is not confined to tomatoes. The virus affects a wide range of hosts including a number of perennial ornamentals and weeds that can act as reservoirs and initiate outbreaks whose source might remain obscure. Whether or not it is found in tomatoes, the disease should be looked for in other plants, especially, perhaps, in the vicinity of ornamental nurseries or greenhouses as in the West Virginia occurrence. It is probable that transportation in diseased ornamentals may be the chief

method by which the virus is carried from one place to another.

It is advisable, also, to investigate thoroughly all cases of streak, and especially of spotted wilt. The latter disease has a fairly wide recorded distribution in this country. On tomato it has been reported from all of the Pacific Coast States, and from Utah, Wisconsin, Michigan, Missouri, Illinois, Ohio, Texas, Pennsylvania, and New York. For reasons already given, it would not be strange if tip-blight were also present. Where spotted wilt is found, every effort should be made to determine definitely whether or not tip-blight is present.

TWO CERCOSPORAS NEWLY REPORTED IN THE UNITED STATES

CERCOSPORA ON POPPY IN ALABAMA: Dr. George W. Carver of Tuskegee Institute sends a specimen of Cercospora on the cultivated poppy with the comment that the fungus has been unusually destructive during the present season. The fungus produces numerous circular to irregular dull brown to gray spots up to a cm. in diameter on the leaves. The spots show on both leaf surfaces and often coalesce to form large irregular blotches. The fungus is Cercospora papaveri Muller & Chupp described from and heretofore known only from Brasil. Doctor Chupp confirms the determination, noting however that the specific name is preoccupied so that it will be necessary for him to rename his species. Earlier reports of Cercospora sp. from Texas and Cercosporella sp. from Florida on the cultivated poppy possibly may be referred to the Muller and Chupp species. With these exceptions Doctor Carver's report is the first for the United States. His abundant and carefully prepared specimen is the only material available of the species in the Mycological Collections of the Bureau. (John A. Stevenson, Division of Mycology and Disease Survey).

CERCOSPORA ON BELLADONNA IN VIRGINIA: In Appomatox County, Virginia, 32 acres of the drug plant Atropa belladonna are being grown as a war emergency project. A leaf spot is causing considerable injury according to a report from the county agent accompanying specimens of infected leaves. The fungus on the leaf spots was identified by J. A. Stevenson of the Division of Mycology and Disease Survey as Cercospora atropae Kvashnina, which has not been recorded previously from the United States. (S. B. Fenne, Extension Pathologist, July 3).

PEONY ANTHRACNOSE FOUND IN ILLINOIS

D. B. Creager and G. H. Boewe

In 1915 H. H. Whetzel (2) reported in New York a disease of peony which he referred to as anthracnose, and in 1940 Freeman Weiss (1) briefly discussed a peony anthracnose which was observed in North Carolina in 1938. Neither of these pathologists were able to establish definitely the cause of the disease, and Weiss was unable to determine whether the disease from North Carolina was identical with that found by Whetzel

in New York. These 2 rather limited reports appear to be the only published information on the occurrence of peony anthracnose in this country or abroad.

In 1941 the writers found a disease of peony possessing all of the characteristics of a true anthracnose type of disease in 3 widely separated commercial peony plantings in southern Illinois. The disease recurred in the same plantings again this year. Varieties found infected with this anthracnose were Couronne d'Or, Karl Rosenfield, Sarah Bernhardt, William Penn, and Alsace Lorraine. Couronne d'Or, which appeared in all 3 plantings, was the most severely affected variety.

The disease affects stems, leaves, bud scales, and flower petals. It can be responsible for marked reduction in yield and quality of flowers, as well as complete destruction of stems and, in some cases, death of entire plants. Most infections occur when the shoots are still young and the leaf and stem tissues are quite succulent.

Lesions on stems range from small, elongated reddish spots, which enlarge into lesions with somewhat grayish centers and reddish borders, to extensive zonate cankers. Cankered stems are commonly twisted, bent or curled. When very young stems are infected, they may be rapidly blighted and completely killed.

On the leaves, spots occur along veins as well as in the tissue between the veins and on the petioles. These spots vary from small, elongated reddish lesions, some of which as they enlarge become circular in outline with grayish centers and reddish borders, to irregular brownish lesions at edges of leaf blades. Infected leaves are often curled and puckered, a condition which results when spots develop at the edges of leaflets before the leaves are mature.

Buds are blasted when bud scales and outer petals become infected. Also, development of spots and cankers on the upper portions of stems disfigures and distorts the flower pedicel and can indirectly cause bud blast and otherwise interfere with flower development.

Associated with lesions on stems, leaves, and buds is a species of Gloeosporium which fruits abundantly in the dead tissue. Acervulae from which pink spore masses exude profusely develop, especially in stem cankers and blasted buds. Specific identity of this Gloeosporium has not been fully established, although morphologically it somewhat resembles G. fructigenum Berk.

Results of preliminary inoculation tests conducted on peony plants of the Couronne d'Or variety forced in the greenhouse indicate that the peony Gloeosporium is the anthracnose pathogen. In these studies the pathogenicity of the Gloeosporium isolated from peonies was compared with G. fructigenum isolated from apple fruit lesions. It was found that the apple Gloeosporium caused no infection in peony plants, whether or not stems and leaves were wounded, while the peony Gloeosporium caused infection, resulting in the development of typical anthracnose symptoms, in apparently unwounded as well as wounded stems and leaves.

1. Weiss, Freeman. Anthracnose and Cladosporium stem spots of peonies. Phytopath., 30:409-415. 1940.
2. Whetzel, H. H. Diseases of peonies. Trans. Mass. Hort. Soc. 1915 (1):103-112. 1915.

(SECTION OF APPLIED BOTANY AND PLANT PATHOLOGY, ILLINOIS NATURAL HISTORY SURVEY, URBANA).

DIE-BACK OF SAFFLOWER IN TEXAS

Herbert Rich

Since 1940, safflower, Carthamus tinctorius, has been planted experimentally in Texas as a possible source of drying oil. With the exception of a report of a Septoria leaf spot (P. D. R. 25:389), this crop has been quite free from diseases in Texas. However, in an experimental plot on the grounds of the Temple Substation of the Texas Agricultural Experiment Station, a die-back condition was observed this year which has ruined 80% of the crop. The season has been very wet and humid with 50% more rain in April than has been recorded for this month on the past 10-year average. This high precipitation and humidity persisted at the time the young safflower buds began to form and the disease appeared at that time.

In the first stages of infection, the tips of the stems, all of which bear the blooms, die and become dry and light brown at the time the young buds are forming; this being very noticeable against the light green color of the healthy tissues of the plant. As the disease progresses, it proceeds downward, more and more of the top being blighted with the dead leaves remaining attached to the stem. At a very late stage, all that is left living is a few inches of green trunk with a few green leaves attached while the top of the plant is dead and shriveled.

The scaly bracts of the flowering parts and the stems at the point of attachment of the leaves apparently are the avenues of infection. The first infections appeared in the immature buds and this type was most prevalent. The fungus spreads throughout the base of the bloom until it kills the entire bud, then invades the pedicel and advances downward along the stem, killing all branches and leaves past which it spreads.

The other means of infection is at the base of the leaf at the point of attachment to the stem. In this case, the advancing fungus forms a light brown elongated lesion which spreads up and down the stem. This lesion has been observed to girdle the stem, killing all portions of the plant above it.

A fungus, apparently a species of Gloeosporium, was found fruiting abundantly on the stem lesions. A Gloeosporium, possibly G. carthami but not definitely determined, has been found in Indiana and at Arlington Farm, Virginia, but it is not known whether this is the same disease.

(BLACKLAND EXPERIMENT STATION, TEMPLE, TEXAS).

TESTS WITH TWO VARIETIES OF ROSES FOR RESISTANCE TO BLACK SPOT

E. W. Lyle and G. E. Altstatt

A notation appeared (P. D. R. 24:479, Dec. 15, 1940) to the effect that the rose variety, Susan Louise, was observed to be entirely free from black spot. To determine whether the observation was a case

of complete immunity, a test was conducted at Tyler, Texas under conditions considered optimum for infection by the black spot fungus, Diplocarpon rosae. In addition, tests were made allowing natural infection of bushes in the field at College Station and at Tyler. Similarly, the experiments were tried with the hybrid tea, Pink Princess, which has been considered as disease resistant (McFarland, J. H. In Modern Roses II. p. 179, 1940).

In the first experiment a plant of each of the 2 varieties was potted and grown in the greenhouse for about 5 weeks. The tender, new foliage was then inoculated by atomizing with a suspension of conidia. This was followed by an incubation period of 24 hours in a moist chamber at about 60° to 70° F. Examination about 3 weeks later showed that neither variety was immune and that with the variety Susan Louise cane lesions of black spot were also evident.

In the field test at Tyler, 4 plants of each variety were subjected to normal conditions of care and infection with no artificial inoculation. Records taken June 4, 1942, showed that all plants were infected with black spot. With variety Susan Louise, 44% of the leaflets had symptoms of black spot. With Pink Princess, 22% of the leaflets had symptoms. The latter variety showed only slight defoliation as compared with the first.

At College Station, variety Susan Louise showed mild infection of black spot in April and May, resulting in slight defoliation. However, on June 8 there was only a trace of black spot evident. With variety Pink Princess, both black spot and Cercospora leaf spot were noted June 8, a trace of black spot was found on 1 of 5 plants and Cercospora leaf spot was found on 2 of the plants.

The conclusions are that neither variety is immune from black spot. However, a fair degree of resistance was indicated, particularly for variety Pink Princess.

(TEXAS AGRICULTURAL EXPERIMENT STATION, COLLEGE STATION).

SPERGON FOR SWEETPOTATO TREATMENT: LIMITED TEST IN ARKANSAS

V. H. Young

Through the cooperation of the Arkansas State Plant Board, we treated beds of 3 growers of certified slips with wettable Spergon according to the method used by the Kansas Station last year. It was not possible to arrange for non-treated checks on certified beds, but each bed was divided lengthwise into halves and one half bedded with Spergon-treated sweetpotatoes and the other with sweetpotatoes treated by the standard corrosive sublimate method required by the Board. A number of beds on 3 farms were treated, but records were not kept on one farm and on a second were so incomplete that they are not considered of any value. Mr. Ray Hardy of Farmington kept very careful records of the number of plants pulled from each half of each of 3 beds and results from his plantings are reported in the Tables. Inspectors found no black rot in his beds and only a trace of stem rot, so that it is believed that results have no bearing on control of

Table 1. Variety: Nancy Hall. Bedded April 11, 1942. Bed divided lengthwise and half bedded each to Wettable Spergon- and Corrosive Sublimate-treated seed. Ray Hardy Farm, Farmington, Arkansas.

Date of pulling	No. of slips pulled: Spergon-treated	No. of slips pulled: Corrosive sublimate-treated
May 10	200	100
15	500	0
16	3100	3600
17	1000	1500
20	3000	4500
21	4700	1000
25	2500	3000
29	5500	5900
June 1	2200	2200
5	2400	2300
8	2300	2000
12	1700	1500
15	2100	1800
Totals	31200	29400

Table 2. Variety: Puerto Rico. Bedded April 2, 1942. Treatment and location as in Table 1.

May 4	2300	1700
11	4000	0
12	3900	6500
15	3000	4200
24	1700	1500
29	2000	2100
June 1	1000	1000
5	1700	1400
7	1300	1200
10	1900	1700
15	4000	6000
Totals	26800	27300

Table 3. Variety: Nancy Hall. Bedded April 10. Treatment and location as in Table 1.

May 21	0	2800
23	3700	300
28	2100	2300
June 1	1100	1100
5	2300	2000
8	2000	1900
12	900	800
16	1000	1000
Totals	13100	12200

either of these diseases.

It was the feeling of the grower that the Spergon treatment resulted in a somewhat earlier production of slips. Figures appear to indicate some advantage in earliness for the Spergon-treated beds. At the end of the season total yields seemed not enough different to warrant

any definite conclusions regarding effect of treatments on total yield. (UNIVERSITY OF ARKANSAS).

A TOBACCO SEEDBED SURVEY IN MASSACHUSETTS, 1942

W. H. Davis

A survey of diseases in the tobacco seedbeds located in the Connecticut River Valley was made during the period May 8 to June 8, 1942. This period was chosen because at this time, the growers removed the sash while pulling seedlings for transplanting, and the inspector was afforded a better opportunity than at other times for examining seedlings and detecting both symptoms and parasites.

This tobacco region is a broad river valley shaped somewhat like a trapezium, about 2 miles wide at the north and about 20 miles at the south, extending from the vicinity of Greenfield southward to Westfield which is near the border of Connecticut. The region is enclosed by the Berkshire foothills on the west and by the Pelham hills on the east.

Most of the seedbeds were in the open and constructed of sideboards supporting glazed sash. This year, the beds were seeded between April 1 and April 10. A majority of the growers raised their own seed which was cleaned and tested at the State College Seed Laboratory. Eight growers applied either sprays or dusts as disease preventatives while others simply "took a chance."

Over 80% of the inspected seedbeds contained rotted manures which had been plowed under during the previous autumn and 70% of these growers believed this was a favorable procedure. Fifty % of these seedbeds were prepared in new locations. Every old seedbed that had not been rotated contained either bare areas or diseased and unusable seedlings.

Many growers complained about the cool, cloudy weather which they thought unfavorable for the seedlings because most of them appeared pallored, or a light green color. It is true that there were 11 days in succession with less than 11 hours of bright sunshine. Growers also thought the temperatures were too cool. The average minima for April and May were 41° and 53°F. respectively; maximum temperatures 61° and 73°. Most of the growers were obliged to retain the sash covers during most of the growing period and especially just previous to transplanting, thus depriving the plantlets of their controlled hardening period.

Seedbeds inspected: Within the Valley, 70 representative seedbeds were inspected and a number of these were reinspected at the request of the owners. Most of these inspections proved beneficial since they either confirmed or denied previous suspicious symptoms such as mosaic and a yellowing which was due to sash-shade and cloudy weather.

Acreage: The acreage per grower varied from 120 in the large plantations to 3 on the small farms. One company set about 1200 acres in different locations, but the set on the farms inspected averaged 11.2 acres. Some growers stated that they were "raising some potatoes this year instead of all tobacco."

Seed and seedlings: Most of the seed was homegrown and from the 1940 crop, but 2 growers believed that transplants obtained from

the 1941 seed were smaller and more easily controlled during development. However, this impression has not been verified. Some growers seeded several beds at different periods or at intervals one week apart, thus obtaining a better opportunity both for choosing seedlings of the desired size and vigor when the variable weather was favorable for transplanting, and for harvesting at different periods.

Seed testing and sowing: All the growers but 3 sowed seed cleaned at the M. S. C. Seed Laboratory. Most of the seedbeds were planted during the first week, but some as late as the third week, in April. The earlier seedlings proved preferable.

Ninety % of the growers agreed that they seeded too heavily producing plants that were "too leggy and the chit too high." Careless seed-covering also was observed in many beds. Otherwise the seedbeds were fairly well prepared and seeded.

Diseases: Wildfire [Phytomonas tabaci] was found in 5 seedbeds, 3 of which had been seeded in the same location for the past 3 years and one for 5 years. These plants had not been sprayed or dusted and only 8 of the seedbeds inspected had received any preventative treatments. All diseased plants were removed as soon as observed, the locations marked and the beds reinspected one week later except those with downy mildew.

No attempt was made to determine the organisms causing each separate case of damping-off because the parasites had appeared earlier in the seasons and were either nonviable or inactive. Growers believed that there was more damping-off this year than usual because the conditions were more favorable. The weather had been cool, the soil wet, the seedlings slow growing, crowded, "spindling" and tender. However, as the season advanced damping-off was less prevalent. Thirty % of the seedlings in 3 unsprayed beds had been killed while those nearby in sprayed and dusted seedbeds were healthy. Both brown [undet.] and black root rots [Thielaviopsis basicola] were observed. These were mostly in neglected beds with wet soil.

Downy mildew ("blue mould") [Peronospora tabacina] was first observed at 2 stations about 25 miles apart. A total of 7 seedbeds were found infected: 3 in the Westfield area, 3 near Sunderland, and 1 near Hadley. The seedlings and beds were treated with paradichlorobenzene almost as soon as the disease was detected. In one treated bed, the plantlets were so severely injured by the fungus that they appeared useless and not suitable for transplanting. Applications of P.D.B. as directed controlled this fungus satisfactorily but it was difficult to purchase immediately and the growers did not have an emergency supply. The growers remarked that they did not wish to transplant from these infected seedbeds even after treatments. Three diseased plants were found in the field.

Types of mosaic [virus] were difficult to distinguish from pallor due to the lack and variation of sunlight. However, 12 seedbeds showed mosaic. Diseased plants were removed, their location marked and another inspection made 10 days later, and the plants were dusted to control insects.

A physiological symptom was observed which was called "fish yellows", associated with applications of too much oily fish fertilizer. The plants were chlorotic, somewhat dwarfed, and spindling,

the lower leaves were often rotted, with some root injury. With excessive watering and good care plants often recovered.

Other diseases: Soft rot of the leaves and crown; stunting; belated and poor seed germination; sunburn; drop of the lower leaves; were some of the other symptoms the causes of which were unknown and uncertain, possibly due to a combination of factors. (MASSACHUSETTS STATE COLLEGE).

REPORTS ON LATE BLIGHT AND OTHER POTATO DISEASES

LATE BLIGHT ON LONG ISLAND (from Weekly News Letter for dates indicated. No late blight has appeared in up-state New York as yet):

June 22 -- Late blight (Phytophthora infestans) was reported as appearing on the South Fork of Suffolk County on June 18 or 19 (W. G. Been), and in the Hicksville area of Nassau County June 20 (H. H. Campbell).

June 29 -- Late blight has appeared here and there in the North Fork and western part of Suffolk County (James E. Dewey).

Late blight is present in many fields in Nassau County, particularly in Cobblers. The past week's weather, with showers followed by temperatures as low as 55°F., permits further blight infections to develop (H. H. Campbell).

One field observed in Nassau County was rather severely infected throughout. It had been treated 3 times with a yellow cuprocide. In other fields the infection centers are few but can be found with a little searching. Most growers have a good covering of copper on, but the vines are rather thick, making it difficult to cover the center and lower leaves. (R. W. Roth).

July 6 -- Late blight did not spread much during the week. Little evidence of blight is to be seen on the North Fork of Suffolk County. It is more generally distributed, but not in serious proportions, in Nassau County. The rains of July 1 and 2 may have increased the spread and intensified the infection. (R. W. Leiby).

Late blight is present in many fields in Suffolk County. Through the day and night of July 2 0.65 inches of rain fell, with a minimum temperature of 69°F. (J. E. Dewey).

LATE BLIGHT IN PENNSYLVANIA: Late blight was first observed on June 25 at Lehighton in Carbon County, by A. H. Bauer. (R. S. Kirby, Pennsylvania State College).

EARLY APPEARANCE OF LATE BLIGHT IN WISCONSIN: Late blight was found June 26 on the Station Farm where seedling potatoes were planted from stock known to be infected. This is the earliest report of late blight in Wisconsin so far as my records show. It is understandable because we have had an excessive amount of rain during recent weeks. (R. E. Vaughan, University of Wisconsin College of Agriculture. July 2).

LOSSES CAUSED BY POTATO DISEASES IN THE HASTINGS SECTION, FLORIDA, IN 1942: The weather was too dry for best development of late blight

(Phytophthora infestans) except in the early crops, and the loss due to it was estimated at 1% which was much below the 11-year average annual loss of 4.8%. Blackleg (Erwinia carotovora) [E. phytophthora], which was found mostly in the Sebago variety, caused the greatest loss, estimated at 3%. Some lots of Sebago seed consistently led to the development of much blackleg in some fields, while in fields planted with other lots of seed, little blackleg appeared. March and April temperatures were too low for the development of brown rot (Bacterium [Phytomonas] solanacearum), which was confined almost entirely to fields planted late and not dug until May 15 and later. Most of the loss due to rhizoctonia (Rhizoctonia solani) occurred in the early part of the season when the causal fungus "burned-off" the young sprouts. The total loss of 6.2% caused by all the potato diseases at Hastings in 1942 is next to the lowest recorded for the last 11 years.
(A. H. EDDINS, POTATO DISEASE INVESTIGATIONS LABORATORY, HASTINGS).

REPORTS ON DISEASES OF SMALL GRAINS

ANTHRACNOSE UNUSUALLY PREVALENT ON WHEAT IN OHIO: Anthracnose of wheat, caused by Colletotrichum cereale [C. graminicolum], is unusually prevalent in Ohio this year. An examination of 45 fields in the northeastern part of the state revealed a wide range of infection varying from a trace to 100%. In 10 of the 45 fields every culm examined was diseased. Fruiting bodies were most conspicuous on the second and third nodes. This is a characteristic of the anthracnose disease of wheat. A leaf blight, when the grain was still in the soft dough stage, was particularly striking, because of the ashy-gray color of the blighted leaves. Later, fruiting bodies of the Colletotrichum developed on them. Anthracnose is of more economic importance than any other disease in many wheat fields in Ohio this year.
(R. C. THOMAS, OHIO AGRICULTURAL EXPERIMENT STATION, JULY 8).

DISEASES OF SMALL GRAINS IN PENNSYLVANIA: Wheat leaf rust (Puccinia triticina) [P. rubigo-vera tritici] was first observed June 4 at Limerick in Montgomery County. Infection was severe on the top leaves when the wheat came into flower and seemed to kill these leaves before the soft dough stage. Throughout the State leaf rust attacked earlier and was more destructive than for many years. The aecial stage of oat crown rust (P. coronata) was found June 13 on a buckthorn hedge at State College. Powdery mildew (Erysiphe graminis) was unusually severe early in the spring on winter barley. (R. S. Kirby, Pennsylvania State College. June 30).

RUSTS IN SOUTHWESTERN VIRGINIA AND IN WEST VIRGINIA: Stem rust (P. graminis) infection in winter wheat fields observed June 18-20 varied from a trace to heavy, while leaf rust was abundant. On oats crown rust occurred in unimportant amounts in virtually every field but stem rust was noticed only occasionally. (H. B. Humphrey, Division of Cereal Crops and Diseases).

GRAIN DISEASES IN SOUTH CAROLINA: On a trip from Clemson to our Edisto Station, Blackville, South Carolina, about 50 miles south of Columbia, I saw no stem rust and very little leaf rust. Mr. W. C. Nettles, the Extension Pathologist and Entomologist, who has spent considerable time over a period of 3 or 4 weeks on a survey of diseases of small grains, says that he saw very little stem rust. He reports, however, that there was considerably more leaf rust than last year. Last year was a very light leaf rust year for South Carolina. Another observation of interest concerns powdery mildew of wheat, which was very general last year and serious in many fields. This year, Mr. Nettles says that he did not see any powdery mildew.

He reports, also, that none of the growers mentioned oat smut [Ustilago sp.] to him and that he saw very few smutted heads. Coker's smut-resistant oats are being widely planted and we suspect that this is a big factor in the low incidence of smuts.

Barley is still a crop of minor importance in this State but there has been a decided increase in the acreage in the past 2 or 3 years. Where seed treatment was not practiced, both stripe [Helminthosporium gramineum] and covered smut [Ustilago hordei] were generally found. Mr. Nettles reports a case in one field of about 15 acres where both of these diseases were rather prevalent and a loss of about 50% was being incurred. Marrett's barley and the Clemson barley are being grown rather generally and both of these seem to be very resistant to powdery mildew. (Geo. M. Armstrong, Clemson Agricultural College. June 20).

SMALL GRAIN DISEASES IN TEXAS: Around Denton small grains surviving the greenbugs have been very slow in maturing owing to the moderate to cool weather. Leaf rust of wheat spread very slowly during the season and even on the most susceptible strains has reached a maximum of only 50% infection. Stem rust has not appeared this year owing to the cool weather. Septoria tritici again has caused serious defoliation. For the past 3 seasons this organism has been an important factor in yield.

The cooperative small grain nurseries at the U. S. Cotton Field Station, Greenville, were observed on May 7 and again on May 30. Crown rust infection was heavy in this planting even on Victoria hybrids. Only a trace of stem rust was present. Considerable leaf rust [Puccinia anomala] on barley was noted. Septoria tritici was prevalent in the wheat nursery. Very low infection of either leaf rust or stem rust was present. (I. M. Atkins, Division of Cereal Crops and Diseases).

REPORT ON CEREAL DISEASES IN KANSAS TO JUNE 15, 1942: The threatened leaf rust epiphytotic on winter wheat in Kansas failed to materialize owing to unusually cold weather during May and early June. Primary infections were abundant in April but temperatures were too low for heavy infection and rapid development during May. Infections are heavy along the eastern edge of the area of heavy wheat acreage extending from Harvey County straight north into Nebraska on a line running through Manhattan. In western Kansas dry weather during May dried up leaves and little leaf rust has appeared there to date. Moderate infection is present in low spots, river bottoms, and occa-

sional localities, but in general infection is very light. In eastern Kansas the acreage of wheat is small and the crop is late owing to late sowing. Leaf rust infection in that area was light on June 12.

The first infections of crown rust of oats, stem rust of oats, and stem rust of wheat were found at Manhattan on June 5. Crown rust of oats is developing rather rapidly and now is well distributed. Only traces of both of the stem rusts can be found in most fields at the present time. It has been much too cold for the rapid development of stem rust. Traces of stem rust of wheat, stem rust of oats, and crown rust of oats were observed in southeastern Kansas on June 10 to 12. No stem rust has been reported from the western half of the State. In general it now seems certain that 1942 is not to be a year of severe rust infection in the Central Plains area. Leaf rust of wheat will cause losses in some localities and crown rust of oats remains a potential threat. Stem rust seems unlikely to be severe on any crop. This is due partly to unseasonably cold weather and partly to a shortage of inoculum from the south.

Leaf blotch caused by Septoria tritici is moderately heavy in southeastern counties, especially on Kawvale. The disease also is present but not severe at Manhattan. Lesions appearing to be caused by Septoria sp. were observed on winter barley and spring oats at Thayer, Kansas, on June 10.

Winter barley is good in the eastern half of Kansas this year. Some fields were severely attacked by mildew and at present some fields show heavy infections of barley leaf rust. Only a little leaf rust has been seen on spring barley. Covered smut was observed in some fields of winter barley and loose smut [U. nuda, etc.] is common in spring barley. Loose smut [U. avenae] was observed to be abundant on Kanota oats in southern Kansas on June 10 to 12.

The acreage of rye in the State is larger than usual this year probably because of the inability of farmers to plant winter wheat at the proper time. Nearly all rye is heavily infected with leaf rust [P. rubigo-vera secalis] although many individual plants show resistance. (C. O. Johnston, Division of Cereal Crops and Diseases).

CEREAL LEAF RUSTS IN SOUTH DAKOTA: Barley leaf rust was first observed at Brookings June 18 and is prevalent but not yet severe. Inasmuch as barley is for the most part headed out it may be surmised that eventual leaf rust damage will probably be less than on oats and wheat. Barley is already exhibiting the usual gamut of defoliation diseases other than the rusts so that rust damage will probably be obscured, perhaps limited, by other fungous and bacterial leaf pathogens. Leaf rust of wheat is now present on the top leaf of susceptible varieties and will soon be severe. (W. F. Buchholtz, South Dakota Agricultural Experiment Station. June 26).

CEREAL DISEASES OBSERVED IN SOUTHERN CALIFORNIA AND ARIZONA: (April 26 to May 6). Baart 38 is now grown on nearly all the wheat acreage in Kings County (Tulare Lake), California, and in the Salt River Valley of Arizona. Mixtures of Pacific Bluestem in the original release still persist, despite severe rust epidemics in 1940 and 1941, in about the original proportion of 1 plant in 800. New seed stocks,

free of mixtures, are in the hands of a few growers so certification of the mixed stocks will probably cease with this crop. White Federation 38 is probably the only variety now grown in the Imperial Valley of California.

Rather severe mildew was observed on White Federation 38 in the Imperial Valley, and on Ramona in the Antelope Valley.

Slight traces of stem rust were seen on White Federation 38 in the Imperial Valley, with a moderate rusting of Ramona on the Experiment Station. Stem rust overwintered on an August planting at Tucson, Arizona. Severe rusting of Baart and Sonora, slight (3 type) rusting of Thatcher, and no rusting of Kubanka occurred in this planting; whereas adjacent plantings of these varieties made at later dates showed only traces of rust spread from the August planting.

No stem rust was seen on oats.

Light traces of leaf rust were seen in the Imperial Valley on wheat and on barley.

Stripe rust [P. glumarum] occurred in light to severe infections over all the area visited, particularly on White Federation 38. In Arizona characteristic stripes and leaf curling without sporulation were seen. In the Imperial Valley the situation was similar, though here some of the "stripes" were actually producing a few spores. In southern San Joaquin Valley sporulation was abundant. This was the most widespread and severe expression of stripe rust I have ever seen in California.

Smut in wheat was not seen. Covered smuts of barley and oats were frequently encountered, but seldom in more than trace amounts.

Barley stripe was not seen. Scald [Rhynchosporium secalis] was light in the San Joaquin Valley and absent elsewhere. Net blotch [Pyrenophora teres] was general but not severe. A blotch (smaller blotches than spot blotch) was general, but light in Arizona. (C. A. Suneson, Division of Cereal Crops and Diseases).

CEREAL DISEASES IN CENTRAL CALIFORNIA: Report on a field trip (May 18 to May 20) in San Joaquin, Merced, and Stanislaus Counties. On wheat light to medium heavy infections of stripe rust are general for the area. Septoria is general, but not severe. Foot rot was observed as "taking" an occasional single plant. A trace of leaf rust was observed in southern Merced County.

On barley scald is rather severe in the eastern San Joaquin Valley, even on January 1 plantings. Some stripe (maximum infection 1%) was observed. Foot rot occurred as described for wheat. Mild infections of mildew were evident in a few localities. Covered smut was encountered in trace amounts.

No diseases were noted on oats. (Ogden C. Riddle, Division of Cereal Crops and Diseases).

REPORTS ON DISEASES OF FRUIT CROPS

RED STELE OF STRAWBERRY ON PATHFINDER AND ABERDEEN: Red stele root rot (Phytophthora fragariae) has caused severe losses in Illinois

during the present season. The severity of the disease is probably due to favorable weather conditions for the development of the fungus in the soil. A relatively dry April was followed by a wet May with continuous cool periods followed by high temperatures during the fruiting period. Under these conditions the resistant Pathfinder, which is being extensively grown to replace the susceptible Premier in Eastern Illinois, has saved many of the growers from almost complete loss of their crop. Blakemore was hard hit in the Farina region (South-central Illinois).

At Urbana a 3-year-old row of Aberdeen on infested soil showed some red stele and at Paris, (Edgar County), Pathfinder was found to be infected in several fields although the injury was very slight compared to other varieties. These 2 varieties have been regarded as very resistant if not immune by a number of observers in this country and in Scotland. Our field observations were confirmed by microscopic examination. It is probable that these varieties have sufficient resistance to be utilized where the soil is known to be infested in spite of their lack of complete immunity. (H. W. Anderson and A. S. Colby. University of Illinois).

APPLE SCAB IN RHODE ISLAND: A major discharge of apple scab (Venturia inaequalis) spores took place with the rains of the week-end of May 16. By May 29 scab lesions were appearing on unsprayed or poorly sprayed McIntosh leaves. At that time most of the ascospores had been discharged but enough, between 10 and 25%, remained to cause infection during the next rain, and some were still shooting during the rain on June 4. Scab is much more abundant this year than last. (F. L. Howard, Rhode Island State College).

FRUIT DISEASES REPORTED FROM NEW YORK (Summarized from the weekly issues of the New York State College of Agriculture Weekly News Letter concerning Insect Pests and Plant Diseases, to July 6): In some areas where the rainy weather was of long enough duration an apple scab infection occurred about May 3 to 4, but the first general infection period was reported as probably May 6 to 7, when temperatures were low and leaves were wet for some time. Further primary infection was reported about 10 days later, and again starting about the 20th. During this last period some secondary spread was possible since the first scab lesions on the leaves were reported as appearing May 18 to 21 in various counties. Weather was favorable for the spread of scab during the first part of June; however, in the best sprayed orchards the disease is very well controlled and infection on fruit is scarce. The importance of spraying is evidenced by J. G. Goodrich's report from Niagara County (June 22) "Apple scab infection is about the most severe in a number of years and promises to cut the crop very markedly, owing partly to neglect by owners who either do not have the help to farm properly or else are working in the cities themselves." He added that scab on the stems might be responsible for some of the severe drop of McIntosh fruit, although the main cause was probably poor fertilization since most of the dropped fruits have only a small core of seeds. As usual, in properly cared for orchards in this county, the disease is "so well checked that scab spots are few and far between on the foliage, and practically none on the fruit" according to his report of June 15.

Quince rust (Gymnosporangium clavipes) was first observed on Delicious apples in Dutchess County May 22. Apple rust (G. juniperi-virginianae) has appeared in Dutchess and other Hudson Valley counties and in Suffolk County on Long Island, apparently only on the leaves as yet. Fire blight (Erwinia amylovora), where reported was not very serious. Powdery mildew (Podosphaera leucotricha) was observed on the terminals of Cortland and other rapidly growing varieties in Niagara County (June 8).

F. H. Lewis reported that apothecial fundaments of the brown rot fungus (Monilinia fructicola), with some cups just beginning to form, were found on old peach mummies Wayne County April 24, and about the same time C. G. Small found mature apothecia on peach and prune mummies in Ulster County. In Wayne County the fungus was found fruiting on the pistil of a sweet cherry flower within 38 hours after the beginning of the May 3-4 rain. During June brown rot was generally reported as prevalent on ripening sweet cherries, especially where not well sprayed. In Ulster County C. G. Small reported (June 8) "Some brown rot is appearing on sweet cherries which are nearly ripe. Growers who have used the new organic fungicide 'Fermate' [ferric dimethyl dithiocarbamate] appear to have obtained excellent control even on Seneca cherries, which show severe cracking. This cracking occurred early when the cherries were still green and only partly grown, and there is some possibility of its being due to lack of boron." Cracking of sweet cherries favoring brown rot infection was reported from Columbia and Monroe Counties also.

Some brown rot was reported on sour cherries in Wayne and Niagara Counties and in the latter county some infection occurred on prunes, mostly at curculio punctures. On peaches the disease does not seem to be very prevalent so far. Some blossom and twig blight was reported from Dutchess, Orleans, and Niagara Counties, and in Orange County J. D. VanGeluwe reported brown rot increasing on peaches, particularly on some of the early varieties (June 22). Some twig infection was observed on nectarines in Wayne County, June 4.

Peach scab (Cladosporium carpophilum) and mildew (Sphaerotheca pannosa var. persicae) were reported in Orange County, and leaf curl (Taphrina deformans) in Monroe and Niagara Counties. Valsa cankers caused considerable damage in some young peach orchards in Monroe County, according to R. S. Granger (May 25).

Cherry leaf spot (Coccomyces hiemalis) is apparently not very abundant.

Serious and general dropping of leaves of sour cherries caused by the virus disease cherry yellows ("physiological leaf drop") started during the week ending June 15 in Niagara, Monroe, and Wayne Counties. J. G. Goodrich in Niagara County reports that it seems especially prevalent this year and many growers are alarmed by its spread. Three additional stone fruit virus diseases were found in Niagara County: X-disease on chokecherries which were turning yellow although the disease was not yet evident on peach trees; ring-spot in one cherry orchard; and prune mottle in a prune orchard (June 22).

Botrytis rot attacked gooseberries, currants, and sweet cherries in Ulster County but caused little damage, according to C. G. Small

(June 8). In Orange County, J. D. VanGeluwe reported that it became rather serious on currants during the latter part of May but was well controlled by many growers with the regular rotenone gooseberry fruit worm spray with 3-3-100 bordeaux (May 25, June 8).

A severe wilting, probably caused by Verticillium, occurred in several raspberry plantings in Monroe County, where potatoes, tomatoes, and especially eggplant had been grown within the last several years, according to R. G. Palmer (June 8).

FRUIT DISEASES IN PENNSYLVANIA: The earliest infection of apple scab observed was in Adams County, by H. Miller on May 6. In the central and southeastern part of the State dry weather until after bloom prevented early infections and scab in this area is far below the average in severity. In the northern part early infections took place and scab is more severe than usual. Fire blight was first observed May 15 in Franklin County. The dry weather until mid-May followed by above-normal rainfall caused a period of rapid twig growth that was favorable to fire blight and it is now more severe and destructive than usual. Frog-eye leaf spot (Physalospora obtusa) was first observed by G. L. Zundel in Juniata County, May 20. Dry weather until mid-May in the southeastern part of the State checked the disease until the rainy period started. In this area the disease will be below the average in severity. Rust (Gymnosporangium juniperi-virginianae) was first observed on apple in Berks County, June 17, and apparently will be below average in occurrence. Bitter rot (Glomerella cingulata) was first observed on apples July 8 at Center Square, Montgomery County. Bark canker (Myxosporium corticolum) first noticed June 5 in Lehigh and Montgomery Counties, was slightly more common and destructive than usual.

The first blossom and twig infections of peach brown rot were observed on May 21 by A. H. Bauer in Carbon County. In the southeastern part of the State where dry weather lasted until the shuck-fall period no blossom or twig infection was found. Some twig infection occurred in other parts of the State where there was more rain before shuck-fall. Peach scab is appearing on the green fruit earlier than in most years. It was first observed June 10 in Lehigh County.

Crown gall (Phytomonas tumefaciens) was found by O. S. Cannon on a number of sweet cherry trees in one Erie County orchard, May 7.

Black rot (Guignardia bidwellii) has been found on unsprayed grape leaves in Lancaster, Carbon, and Erie Counties, being first noticed June 9 in Lancaster County. (R. S. Kirby, Pennsylvania State College).

BRIEF NOTES ON PLANT DISEASES

WEED CONTROL BY PLANT DISEASES IN KANSAS: In a spot in which there is almost a solid stand of the weed narrow-leaved goosefoot, Chenopodium leptophyllum, a leaf spot caused by Cercospora dubia already has killed many of the plants and soon will destroy practically all of them. This is one of the finest examples I have seen of biological control of weeds.

I saw one other interesting case this spring. The common henbit, Lamium amplexicaule, is a noxious weed in lawns and waste places here. In certain places this spring that weed was completely eliminated by the attack of some mildew, apparently a species of Erysiphe. (C. O. Johnston, Division of Cereal Crops and Diseases. July 8).

DISEASES OF VEGETABLES AND OF ORNAMENTAL PLANTS REPORTED FROM PENNSYLVANIA: On cabbage, club root (Plasmodiophora brassicae) was first noticed June 19. It is showing up in more seedbeds than usual in Erie County. Black rot (Phytomonas campestris) was observed in Delaware County, June 19.

Carrots in storage at Bristol, Philadelphia, observed February 26, were affected by black root (Alternaria radicina) [Stemphylium radicinum].

Leaf spot (Macrosporium [Alternaria] solani) of eggplant was first observed on June 2 at Smoketown, Lancaster County. It was severe in seedbeds on plants 8 to 12 inches high.

Blight (Ascochyta pisi) of canning peas is apparently more widespread and destructive than usual. It was first observed May 29 in York County.

Soft rot (Erwinia carotovora) of iris is about as severe as usual at State College, where it was first observed June 10.

Leaf spot (Colletotrichum violae-tricoloris) of pansy is more severe than for several years. It was first observed at State College on June 14.

Canker of privet caused by Glomerella cingulata was observed June 13 at State College. Cankers were formed on the stems of the new growth and killed many shoots at the base of the bush. (R. S. Kirby, Pennsylvania State College. June 30).

BACTERIAL WILT AND SMUT ON SWEET CORN: Bacterial wilt (Phytomonas stewarti) was observed in Rockland County, New York, on June 12, according to Wm. J. Clark. F. M. Gordon reported (June 27) " A small amount has been seen in some of the sweet corn plantings in Nassau County, Long Island. Up to the present time it has been light even on the more susceptible varieties."

In Pennsylvania bacterial wilt was first observed June 19 at Hopewell, Bedford County, according to R. S. Kirby.

Small amounts of smut (Ustilago zeae) were reported from Nassau County by Gordon.

FLAX DISEASES IN SOUTHEASTERN KANSAS: Flax in southeastern Kansas varies from poor to excellent this year with a rather extensive excellent area in the neighborhood of Chanute. A little wilt [Fusarium lini] was observed in commercial fields and in experimental plots at Thayer. Considerable dodder [Cuscuta sp.] and a target-board leaf spot also were observed at Thayer. (C. O. Johnston, Division of Cereal Crops and Diseases. June 15).

LEAF SPOTS ON BLUE GRASS AND ALFALFA IN PENNSYLVANIA: Blue grass leaf spot (Helminthosporium vagans) was more common and destructive on lawns throughout the State than for several years.

Wet weather has allowed alfalfa leaf spot (Pseudopeziza medicaginis) to kill many of the lower leaves of the first cutting. (R. S. Kirby, Pennsylvania State College. June 30).

CHECK LIST REVISION

Freeman Weiss

SABAL (PALMACEAE)

SABAL spp., PALMETTO, especially S. CAUSIARUM (Cook) Becc., PUERTO RICO HAT PALM of the West Indies, and S. PALMETTO (Walt.) Lodd., CABBAGE PALMETTO, of the S. E. Atlantic Coast from N. Car. to Fla. (also several closely related spp. as S. minor (Jacq.) Pers., dwarf palmetto, S. louisiana (Darby) Bomhard and S. texana Becc. occurring from Ga. to Texas), grown for ornament in the Gulf States and Calif.

Anthostomella spp., on dead leaf stalks and blades. Ga. to Fla. & La. (Spp. reported include A. leucobasis (Ell. & Mart.) Sacc., A. melanosticta Ell. & Ev., A. minor Ell. & Ev., and A. sabalensioides (Ell. & Mart.) Sacc.

Amerosporium sabalinum Ell. & Ev., on dead leaves. La.

Asterina sabalicola Earle, on living leaves. Fla., Ga.

Cocconia sparsa (Pk. & Cke.) Sacc., on leaf stalks. Fla.

Cenangium sabalidis (Ell. & Mart.) Sacc., on leaf stalks. Fla.

Ellisiodothis inquinans (Ell. & Ev.) Theiss., on dead leaves. Fla., La., Miss.

Fomes aratus Sacc. & D. Sacc. (Ganoderma sulcatum Murr.), on dead trunks. Fla., Ga.

Gnomonia sabalicola Earle, on leaf stalks. Ala.

Graphiola spp., false smut. (G. congesta Berk. & Rav.), Ala., Fla., S. Car.; G. phoenicis (Moug.) Poit., Fla., Miss., P. R.; G. thaxteri E. Fisch., Fla.

Helminthosporium spiculiferum Ell. & Ev., leaf spot. La., Miss.

Hendersonia sabaleos Ces., on leaves. Miss.

Leptostroma micropunctum Cke., on leaves. S. Car.

Linospora palmetto Ell. & Ev., on leaves. La.

Melanconium palmarum Cke., on leaf stalks. Fla.

Meliola palmicola Wint., black mildew. Gulf States, Canal Zone, P. R., T. H.

Metasphaeria palmetta (Cke.) Sacc., on leaf stalks. Ga.

Mycosphaerella serrulata (Ell. & Ev.) Diehl in herb., leaf spot. Fla., S. Car. (Sphaerella sabaligena Ell. & Ev. also reported on dead leaf tips in La.)

Ophiobolus versisporus Ell. & Mart., on leaf stalks. Fla.

Pestalotia palmarum Cke., on leaves. Fla.

SABAL spp. -- continued.

Phyllosticta palmetto Ell. & Ev., leaf spot. La., Miss.
Phytophthora palmivora Butl., bud rot. P. R.
Polyporus tulipiferus (Schw.) Overh., on dead trunks. Fla.
Poria heteromorpha Murr., on leaf stalks. Fla.
Rhabdospora sabalensis Cke., on leaf stalks. La., S. Car.
Schizophyllum commune Fr., on dead trunks. S. Car.
Septobasidium sabalis Couch, fungus felt. La.
S. sabal-minor Couch. Fla.
Sphaeropsis sabalicola Ell. & Carver, on leaf stalks. Ala.
Trametes cubensis (Mont.) Sacc., on dead trunks. Fla.
Valsa sabalina Cke., on leaf stalks. Ala., Fla., Ga.
Venturia sabalicola (Ell. & Ev., on dead leaves. La.

SALIX (SALICACEAE)

SALIX spp., WILLOWS. Occurring on various or unspecified hosts.

Aleurodiscus spp., on bark usually of dead or some times living branches. A. macrodens Coker and A. oakesii (Berk. & Curt.) Cke. reported in Eastern States; A. griseo-canus (Bres.) Höhn. & Litsch. in Iowa & Mo.
Armillaria mellea Vahl ex Fr., root rot. Calif., Wash.
Asteroma capreae Desm., on leaves. Conn.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. (including var. chromogena Shear et al), branch & trunk canker. Md. to Fla. & Ark., W. Va.
Capnodium salicinum Mont., sooty mold. Calif., Wis.
Cenangium populneum Pers. ex Rehm, on dead branches. Colo.
Cercospora salicina Ell. & Ev., leaf spot. Ill., La., Md., Texas.
Chlorosplenium aeruginosum (Oed.) DeNot., green wood stain. Widespread.
Ciboria acerina Whetzel & Buchwald, on staminate catkins. N. Y.
C. caucus (Reb. ex Pers.) Fckl. N. Y., Oregon.
Coccomyces salicinus (Ell. & Ev.) Sacc., on dead branches. Mont.
Collybia velutipes Fr., commonly on stumps & logs, sometimes in wounds of living trunks. N. Y., N. Dak.
Coniothyrium sp., on twigs. Conn.
C. fuligineum (Karst.) Sacc. Alaska.
C. spokanense Sacc. Wash.
Corticium bombycinum (Sommerf.) Bres., on bark, sometimes of living trunks. N. E. States, Texas, Wash. (Other spp. frequent on dead wood.)
Coryneum salicinum (Cda.) Sacc., on twigs. N. Dak.
C. pezizoides Ell. & Ev. Colo., Idaho.
Cryptodiaporthe salicina (Curr.) Wehmeyer (Discella carbonacea (Fr.) Berk. & Br.), branch & twig canker. Me. to Va., Kans. & S. Dak.; Calif., Wash., Alaska.
Cryptomyces maximus (Fr.) Rehm, bark blister. N. Mex.
Cryptosporiopsis scutellata (Otth.) Petr. Conidial stage of Ocellaria ocellata.
Cuscuta spp., dodder. Utah. C. gronovii Willd., N. Y. C. megalocarpa Rydb. Wash.

SALIX spp. -- continued

Cylindrocarpon magnusianum (Sacc.) Wr. Conidial stage of Neonectria ramulariae Wr.

Cylindrosporium salicinum (Pk.) Dearn., leaf spot. Mass. to Colo. & Wis.; Miss.

(C. conservans Pk. is probably the same).

Cytidia flocculenta (Fr.) Höhn. & Litsch., on trunks & branches at times of living trees. Alaska, Mont., Wyo.

C. salicina (Fr.) Burt, on dead branches. Widespread.

Cytospora spp. (especially C. chrysosperma Pers. ex Fr., C. nivea Hoffm. ex Fr., C. salicis (Cda.) Rabh., and C. translucens Sacc.), on twigs & branches, causing or secondary in dieback. Widespread. Conidial stage of Valsa spp.

Daedalea confragosa Bolt. ex Fr., white spongy heart rot, often on living trees. Widespread.

D. ambigua Berk., wood rot. N. Car., Va.

D. unicolor Bull. ex Fr. N. E. States to Va., Kans. & S. Dak.

Daldinia concentrica (Bolt. ex Fr.) Ces. & DeNot., wood rot. Widespread.

D. grandis Child and D. occidentalis Child. Western States.

Diaporthe tessella (Pers. ex Fr.) Rehm, on branches, ? canker. Iowa, La., N. Y.

Diplodia sp., ? twig blight. Calif., Texas, W. Va. Reported as D. salicina Lev. in W. Va. (= D. sarmentorum Fr.) but doubtful.

Diplodina spp., twig blight. Md., Mass., W. Va. (Reported as D. salicis. Westend. or D. salicicola (Johnson) Sacc. & Trav. but probably immature stages of the following:

Discella carbonacea (Fr.) Berk. & Br., twig blight, canker. N. E. States. Conidial stage of Cryptodiaporthe salicina.

Discula microsperma (Berk. & Br.) Sacc., on twigs. Calif.

Dothiora polyspora Shear & Davidson, twig canker & dieback. Colo.

Dothiorella sp., branch canker. Ark., N. Dak.

D. pyrenophora (Karst.) Sacc., var. salicis Karst. on twigs. Alaska.

D. ribis (Fckl.) Sacc. Conidial stage of Botryosphaeria ribis.

Fomes spp., wood rot commonly of dead trunks and logs, heart rot and sometimes sap wood rot of living trees. Spp. reported include: F. applanatus (Pers. ex Fr.) Gill., Conn., N. Y., Wis.; F. conchatus (Pers. ex Fr.) Gill., Mont., N. Y., N. & S. Dak.; F. connatus (Weinm. ex Fr.) Gill., N. Y.; F. fomentarius (L. ex Fr.) Kickx, Ala.; F. fraxinophilus Pk., N. Y.; F. igniarius (L. ex Fr.) Kickx, including var. nigricans Fr., white spongy heart rot, Ind., N. Y., Idaho, Wash., Alaska.

Fusicladium saliciperdum (Allesch. & Tub.) Tub., scab, twig blight. New England to N. J. & Pa.; N. Car. Conidial stage of Venturia chlorospora, which has been reported as occurring naturally in the U. S. only in Colo., though collected in Greenland and possibly in Alaska. Whether this fungus or Physalospora miyabeana (q.v.) is the primary cause of willow shoot blight is still in controversy.

SALIX spp. -- continued

Ganoderma lucidum (Leys. ex Fr.) Karst., wood rot. Va.

Gloeodes pomigena (Schw.) Colby, on twigs. Ind.

Gloeosporium spp., leaf spot., twig blight. Conn., Del., Mass. (Probably in part the conidial stage of Physalospora miyabeana.)

G. boreale Ell. & Ev., leaf spot. Vt., Wyo.

G. salicis Westend. (Gloeosporidiella salicis (Westend.) Nannf.), leaf spot, twig blight. Vt. to N. J., Miss. & Wis.; Oregon. Conidial stage of Pseudopeziza salicis.

G. weirianum Sacc. (Calogloeum weirianum (Sacc.) H. Syd.), on catkins. Colo., Mont.

Helicobasidium purpureum (Tul.) Pat. (Rhizoctonia crocorum (Pers.) D. C.), root rot. Texas.

Hendersonia lineolans (Schw.) Starb., on branches. Pa.

Heterodera marioni (Cornu) Goodey, root knot. Miss.

Hydnum ochraceum Pers. ex Fr., on dead wood. Widespread.

Hypoxylon spp., on dead wood. Many spp. reported, frequently H. morsei Berk. & Curt. and H. rubiginosum Pers. ex Fr. Widespread.

Lenzites betulina L. ex Fr., L. saepiaria Wulf. ex Fr., and L. trabea Pers. ex Fr., brown cubical rot of trunks & logs. Widespread.

Lophium dolabriforme Wallr., on dead twigs. Colo.

Lophodermium versicolor (Wahl. ex Fr.) Rehm, on leaves. Colo., Pa., ? Alaska.

Macrophoma sp. (? Phomopsis salicina (Westend.) Died.), canker, twig blight. Ark., Ky., Miss., N. Car., S. Car., Texas.

M. salicis Dearn. & Barth., on twigs. Mont.

Marssonina spp., leaf spot, rarely on twigs. Widespread. Most reports are without specific identification and several spp. have been described but are not clearly distinguished. Those reported in the U. S. and their distribution are: M. apicalis (Ell. & Ev.) Magn., Calif., Wis., Wyo.; M. kriegeriana (Bres.) Magn., Calif., Wis., Wyo.; M. nigricans (Ell. & Ev.) Magn., Calif.; ? M. populi (Lib.) Magn., Del., Mass., Okla., Wis.; M. rubiginosa (Ell. & Ev.) Magn., Idaho, Wis.; M. salicicola (Bres.) P. Magn. (conidial stage of Drepanopeziza sphaeroides (Fr.) Nannf.), Md., N. Y.; M. salicina Tehon, Ill.; M. salicis (Trail) Magn., Mass.

Melampsora abieti-capraearum Tub. (M. americana Arth.), leaf rust. Throughout the U. S. but not the far North. O and I on Abies spp., but persists in the uredinial stage.

M. arctica Rostr., leaf rust (II, III). Alaska, Colo., N. H. (formerly reported from Wis. to Wash. owing to confusion with the preceding.) O and I on Saxifragaceae but persists in the uredinial stage.

M. bigelowii Thüm., rust (II, III). Me to N. Car., Iowa, N. Mex. and Alaska. O and I on Larix spp. but persists in the uredinial stage and as mycelium in stems.

M. ribesii-purpureae Kleb. (M. confluens (Pers.) Jacks.), rust (II, III). Mont. to Colo., Calif. & Alaska. O and I on

SALIX spp. -- continued
Ribes spp.
Microthyriella rubi Petr., on twigs. Ind.
Mycosphaerella salicina Ell. & Ev., on twigs. Kans.
Myxofusicoccum salicis Died., on branches. ? Ky., Wash.
Myxosporium cytosporeum Sacc., on branches. Wash.
M. salicinum Sacc. & Roum. Mass.
(M. scutellatum (Otth.) Höhn.): Cryptosporiopsis scutellata.
Nectria cinnabarina Tode ex Fr., on twigs associated with dieback. Widespread.
N. coccinea Pers. ex Fr., N. coryli Fckl. and N. galligena Bres., canker. Oregon.
Nummularia clypeus (Schw.) Cke., on branches. Md.
Ocellaria ocellata (Pers. ex Fr.) Schroet. (Cryptosporiopsis scutellata (Otth.) Petr.), branch canker. Colo., N. Car., N. Dak., Pa.
Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves. Va.
Pholiota spp., on stumps & logs, sometimes sapwood rot of living trees. P. adiposa Fr. and P. spectabilis Fr., Northern States; P. aurivelloides Overh., Colo., N. Mex., Wyo.; P. oregonense Murr., Oregon.
Phoma sp., twig blight. Ark., N. Car.
P. platysperma Pk. Ill. (See also Sclerophoma).
Phomopsis salicina (Westend.) Died., twig canker. Iowa, Mass., Va.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Calif., Ind., Texas.
P. macrophyllum Cock. Ariz., N. Mex.
P. longispicum Trel. Ariz., Calif.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.
Phyllosticta apicalis Davis, leaf spot. Kans., Wis.
P. salicicola Thüm. Conn., Idaho.
P. salicis Kell. & Swingle. Kans.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora fusca N. E. Stevens, on branches. Oregon, S. Car.
P. gregaria Sacc., twig canker. W. Va.
P. obtusa (Schw.) Cke., on branches. Va. to Fla. & Tenn.
P. miyabeana Fukushi, black canker, ? blight. Me. to W. Va. (See also Fusicladium saliciperdum.)
P. rhodina (Berk. & Curt.) Cke., on dead branches. S. Car.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Widespread.
Pleurotus spp., commonly on logs & dead trunks, sometimes sapwood rot of living trees. Spp. reported include: P. ostreatus Jacq. ex Fr., Calif., Idaho; P. salignis Schrad. ex Fr., Mich.; P. serotinus Schrad. ex Fr., Mich.; P. ulmarius Bull. ex Fr., N. Car.
Polyporus spp., wood rot chiefly of dead trunks & logs; a few may occur on living trees. Spp. reported include: P. admirabilis Pk., N. Y.; P. adustus Willd. ex Fr., La., N. Car., Wis.; P. caesius Schrad. ex Fr., Mont.; P. cinnabarinus Jacq. ex Fr., N. Y., Wash.; P. dichrous Fr., N. Y.; P. dryophilus Berk., Ohio; P. elegans Bull. ex Fr., Alaska,

SALIX spp. -- continued

Idaho, Wash.; Polyporus fumidiceps Atk., Mo.; P. fumosus Pers. ex Fr., Calif.; P. galactinus Berk., N. Y.; P. gilvus (Schw.) Fr., Nebr.; P. hirsutus Wulf. ex Fr. and P. pargamenus Fr., widespread; P. planellus (Murr.) Overh., Colo.; P. pubescens Schum. ex Fr., N. Y., N. W. States; P. sanguineus L. ex Fr., Mo.; P. squamosus Huds. ex Fr., N. E. States; P. sulphureus Bull. ex Fr., widespread; P. tulipiferus (Schw.) Overh., N. E. States; P. unitus Pers. and P. versicolor L. ex Fr., widespread.

Poria spp., wood rot of logs & slash. Spp. frequently reported are: P. ambigua Bres., Texas; P. andersonii (Ell. & Ev.) Neuman, Md.; P. ferruginosa (Schrad. ex Fr.) Cke., Alaska; P. punctata Fr., Mich., Minn.; P. reticulata Pers. ex Fr., Alaska; P. viticola (Schw.) Cke., N. Car., Pa.

Pseudopeziza salicis (Tul.) Poteb. (Gloeosporium salicis Westend.), leaf spot. Minn. (This is Drepanopeziza salicis (Tul.) Höhn. in Nannfeldt's terminology.)

Ramularia rosea (Fckl.) Sacc., leaf spot. Colo., Mont., Wis.

Rhytisma salicinum Pers. ex Fr., tar spot. General.

Schizophyllum commune Fr., wood rot, usually on dead branches & trunks. Cosmopolitan.

Scleroderris fuliginosa (Pers. ex Fr.) Karst., on branches, ? canker. N. Y.

Sclerophoma salicis Died. (?Cytospora salicis (Cda.) Rabh.), twig blight. Calif.

Sclerotinia foliicola Cash & Davidson, on fallen leaves. Colo.

Septogloeum maculans Harkn., leaf spot. Calif., ? Mont.

S. salicinum (Pk.) Sacc., leaf spot. N. Y., Wis., Alaska.

(S. saliciperdum Allesch. & Tub.): Fusicladium saliciperdum.

S. salicis-fendlerianae Dearn. & Barth., leaf spot. Idaho.

Septoria spp., leaf spot. Most of the spp. reported on willow in the U. S. have been transferred to other genera (see Cylindrosporium, Marssonina and Septogloeum) and some are European spp. not certainly known to occur here, thus: S. albaniensis Thüm. and S. salicina Pk. = Cylindrosporium salicinum (Pk.) Dearn.; S. salicis Westend. as reported here = Septogloeum salicis-fendlerianae Dearn.; S. salicicola (Fr.) Sacc. has been collected in Alaska & Oregon; S. didyma Fckl. is reported from Wis. but confirmation is lacking.

Solenia ochracea Hoffm. ex Fr., on bark sometimes of living trees. Northern States.

Sphaeropsis salicis Ell. & Barth., on dead twigs. Kans., Pa., Texas.

S. salicicola Pass. Md.

Stereum spp., wood rot of dead trunks & branches. Spp. frequently reported include: S. hirsutum Willd. ex Fr., Western States; S. purpureum Pers., Wash.; S. rameale Schw., widespread; S. rufum Fr., Colo., Idaho; S. rugosum Pers. ex Fr., Minn.

Trametes spp., wood rot chiefly of dead trunks & logs. T. hispida Bagl., widespread; T. malicola Berk. & Curt., Wis.; T. mollis (Sommerf.) Fr., Me.; T. rigida Berk. & Mont., La.;

SALIX spp. -- continued
T. sepium Berk., N. Y.; T. trogii Berk, Mich.
Trametes suaveolens L. ex Fr., wound rot, white spongy heart rot. N. E. States to Mont. & Alaska.
Trimmatostroma americana Thüm., on dead twigs. Widespread.
Uncinula salicis DC. ex Wint., powdery mildew. General.
Valsa spp., twig blight, canker; probably mostly secondary. See also Cytospora. Spp. frequently reported: V. boreela Karst., Idaho, Kans., Mich.; V. ambiens Pers. ex Fr., widespread; V. nivea Hoffm. ex Fr., Western States; V. salicina Pers. ex Fr., widespread; V. sordida Nits. (Cytospora chrysosperma Pers. ex Fr.), widespread; and others.
Venturia chlorospora (Ces.) Karst. (Fusicladium saliciperdum (Allesch. & Tub.) Tub.), on leaves. Colo. (Reported also from Greenland but usually known only in artificial cultures in the U. S.)
V. subcutanea Dearn., on leaves. Alaska.
Galls. Caused mostly by insects and related pests as cone gall by the gall midge Rhabdophaga strobiloides, stem gall by R. salicis, and warty leaf gall by the mite Eriophyes aenigma. Aerial galls caused by Phytomonas tumefaciens also.
Tracheobacteriosis. Cause unknown but believed bacterial. Md., Pa., Va.

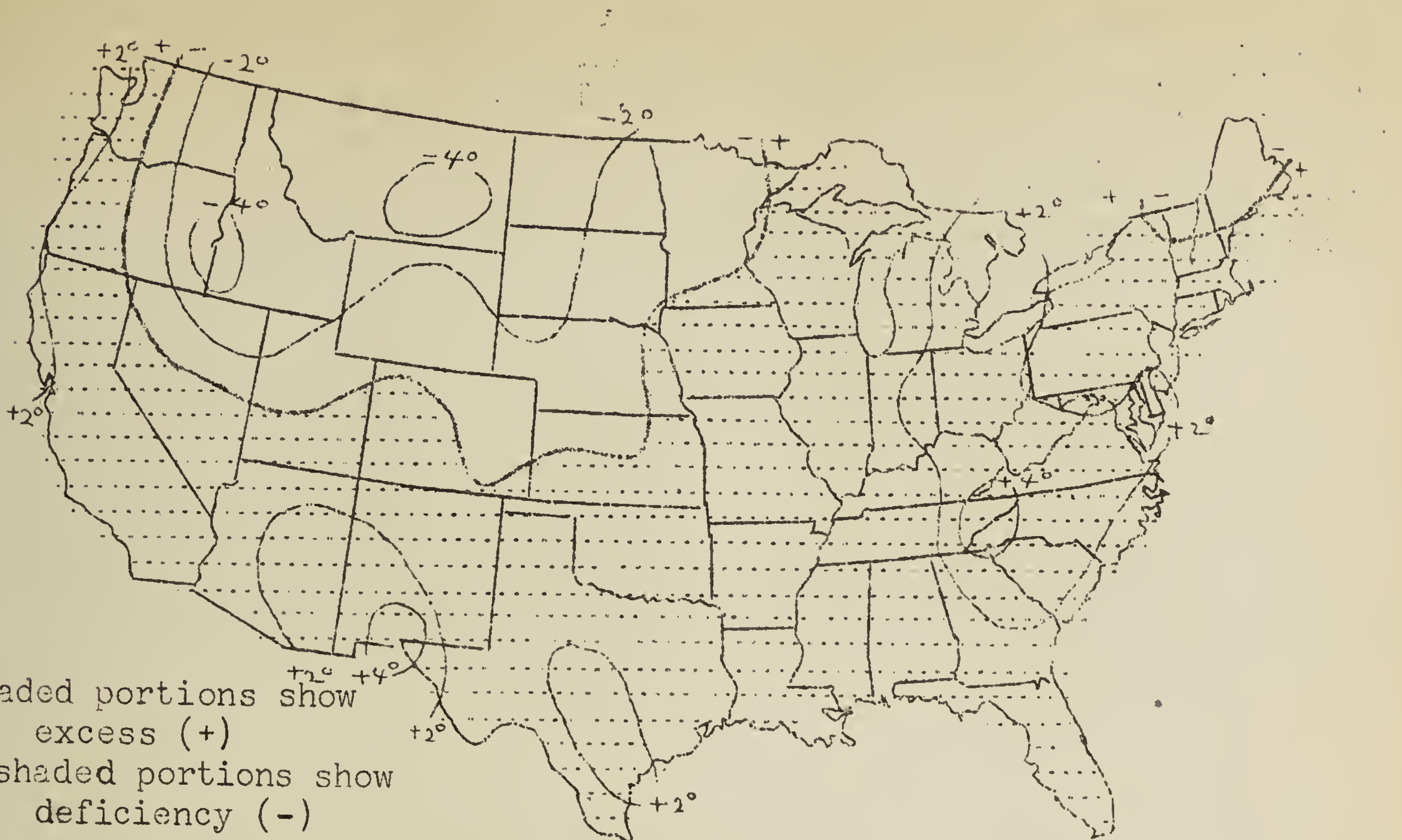
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

JUNE WEATHER

(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin for week ending July 7, 1942).

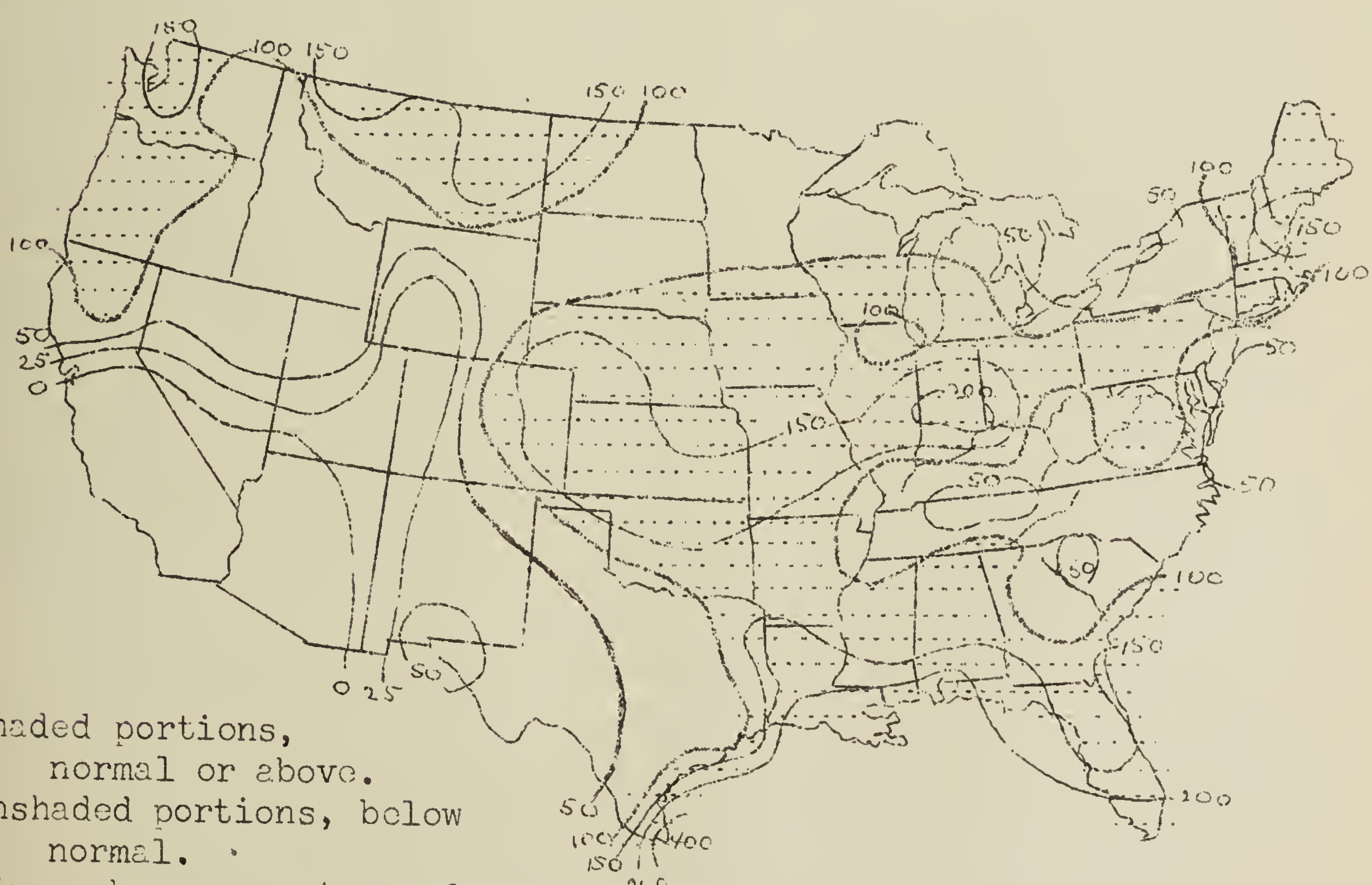
On a basis of monthly averages, June was characterized by nearly normal temperatures in nearly all sections of the country, extreme dryness in the far Southwest, and abnormally heavy rains in much of the interior of the country. Fig. 1 shows that the monthly mean temperatures were mostly 1° or 2° above normal in central and eastern States, with limited areas having plus departures of 4°. Also, in Pacific coast sections and in the Southwest about-normal warmth to 2° or 3° above normal was the general rule. On the other hand, from the upper Great Plains westward to the interior of the north Pacific area the month was somewhat cooler than normal; a few stations reported minus anomalies as great as 4° or 5°. For the country, as a whole, there was an unusually uniform distribution of near-normal temperatures.

Fig. 2, based on first-order stations only, shows a decidedly uneven distribution of precipitation. The amounts were above normal in most localities from Virginia northward, in the central Gulf area, central valleys, the southwestern Plains, and the far Northwest. The outstanding features were the persistent dryness in the Southwest and continued heavy rains in many interior localities, especially the southern Plains and upper Mississippi Valley. Some outstandingly heavy falls for the month included Des Moines, Iowa, 9 inches, the wettest June since



Shaded portions show
excess (+)
Unshaded portions show
deficiency (-)
Lines show amount of excess or deficiency.

Figure 1. -- Departure of Mean Temperature from the Normal for June 1942.



Shaded portions,
normal or above.
Unshaded portions, below
normal.
Lines show percentage of normal.

Figure 2. -- Percentage of Normal Precipitation for June 1942.

1924; Louisville, Ky., 8.48, the wettest of record, and Dodge City, Kans., 6.06 inches, the wettest since 1912. Also, rainfall was extremely heavy in parts of the Gulf area, Brownsville, Tex., having 13.06 inches and New Orleans 16.01, the greatest of record. On the other hand, a considerable southwestern area experienced another dry month, making the second in succession with practically no rain.

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THE PLANT DISEASE REPORTER

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IN THIS ISSUE

BACTERIAL LEAF SPOT OF VIBURNUM

H. W. Anderson and H. H. Thornberry

In 1931, Thornberry and Anderson described a bacterial leaf spot of Viburnum (Phytopath. 21:907-912) and named the organism Phytomonas viburni. Since then the disease has constantly appeared on one group of shrubs near the Agriculture Building on the Illinois campus. Later it was observed on the Wisconsin campus at Madison. It was only occasionally observed in the many plantings of Viburnum opulus in the Urbana region until this year. At present (July, 1942) the Viburnum leaf spot may be found on most of the plantings on the campus, and the spotting is often pronounced enough to be disfiguring. The disease was also observed this year at the Morton Arboretum, Lisle, Illinois. It is evident, therefore, that this disease is latent and inconspicuous in years of normal rainfall but may become of real importance during exceptionally wet seasons. (UNIVERSITY OF ILLINOIS, URBANA).

BACTERIAL RING ROT OF POTATO IN ARIZONA

Wm. G. Hoyman

The first authentic case of bacterial ring rot of potatoes in Arizona was reported from the Salt River Valley, Phoenix, Arizona, the summer of 1940. The following year this disease was found on a farm in north-central Arizona. In June of 1942, at the beginning of the potato harvest, a survey of all the commercial potato fields in the Salt River Valley was made to determine the presence or absence of this disease. The potatoes in the fields of 8 growers were examined, as well as discarded stock lying around the packing sheds. Material was collected and brought to the laboratory for diagnosis. The organism causing bacterial ring rot [Corynebacterium sepedonicum] was isolated from the tubers from 4, or 50%, of the farms visited. Losses were very small, being less than 1%. Most of the seed was obtained from out of the State. The varieties White Rose, Katahdin, and Bliss Triumph were represented among the diseased stock.

A few days following the Salt River Valley survey, potatoes were received from Duncan, Arizona, a potato growing district in the southeastern part of the State. The pathogen was isolated from this material. (UNIVERSITY OF ARIZONA).

BRIEF NOTES ON PLANT DISEASES

POTATO LATE BLIGHT IN NEW YORK (From Weekly News Letter, July 13): The cool cloudy weather with occasional rains or mist, and especially the cold nights with heavy dew that have prevailed at times during the past month, have been favorable for the development of Phytophthora infestans. (M. F. Barrus).

From Wayne County in western New York, W. D. Tyler reported "The first late blight was found this week (July 4)."

The disease is increasing on Long Island. J. E. Dewey reported from Suffolk County "Late blight has appeared in increasing amounts during the past week and many of the lesions are still in the active stage." In Nassau County "The present urgent problem is checking the spread of late blight", according to R. W. Roth. "Infection centers are evident in every field in varying amounts. Some early potatoes may possibly be affected with tuber rot as the disease has killed the vines at least a week early. If the weather becomes favorable for the spread of the disease many growers will lose heavily."

BACTERIAL BLIGHT OF PERSIAN WALNUT IN NEW YORK: In Niagara County blight [Phytomonas juglandis] is bad on the husks of English walnuts. Infection occurred during our wet blossom period. (J. G. Goodrich, Weekly News Letter, July 13).

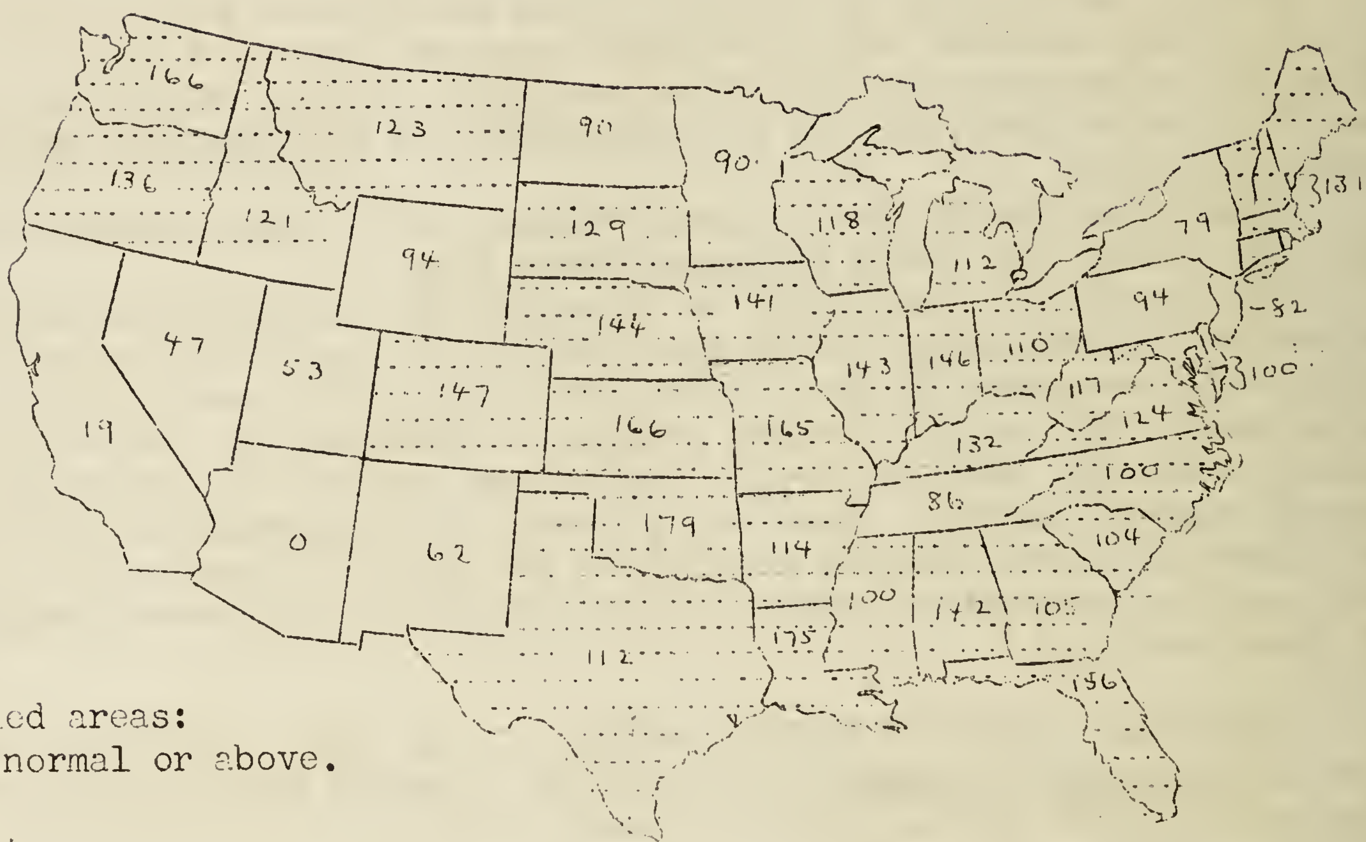
DODDER ON PETUNIA: A correspondent in Silver Spring, Maryland, sent a plant attacked by Cuscuta sp., with the statement that all the plants in her petunia box were being killed.

PERCENTAGE OF NORMAL PRECIPITATION BY STATES

(From U. S. Department of Commerce, Weather Bureau, Weekly Weather and Crop Bulletin for week ending July 14, 1942).

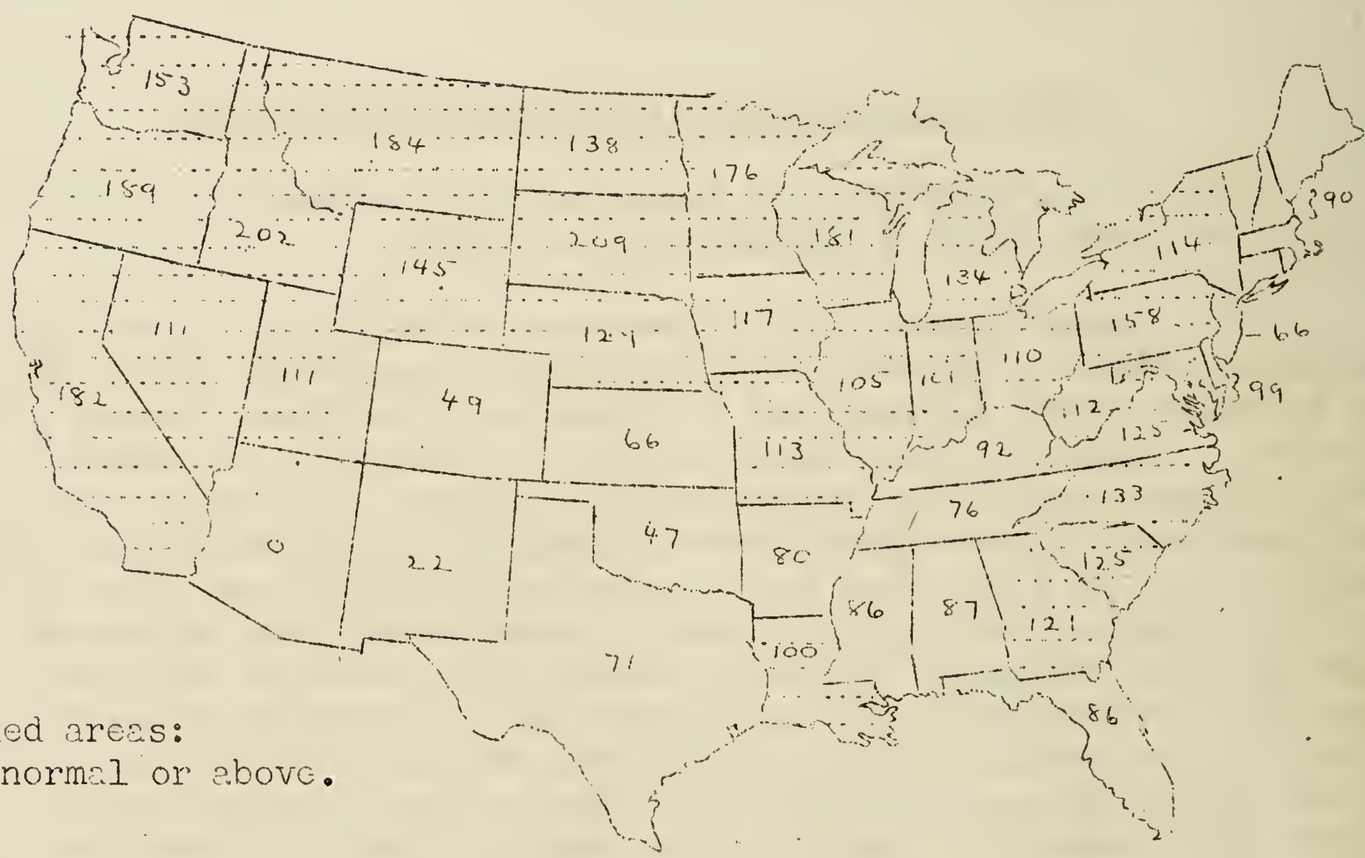
The 4 maps, Figures 1 - 4 show, respectively, the percentage of normal precipitation, by States, for June, for the preceding month, May, the last 3 months, April - June, and the first half of 1942, January - June, inclusive. Figure 1 shows that June was an abnormally wet month in most of the country, especially the interior valleys. All States east of the Rocky Mountains, except North Dakota, Minnesota, Tennessee, New York, Pennsylvania, and New Jersey had above-normal rainfall and most of them far above normal. On the other hand, a considerable far southwestern area experienced an extremely dry month, making the second in succession - see Figure 2. The wettest State was Florida with an average of 10.47 inches, 156 percent of normal, and the driest Arizona which had no appreciable rain. For the United States as a whole, the June average was 3.50 inches, or 23 percent above normal; it was the third wettest June of record, surpassed only in 1928 and 1941.

Figure 3 shows for the last 3 months substantial to marked excesses of precipitation for all except the more eastern and a couple of far southwestern States. Also, for the first half of the current year, Figure 4,



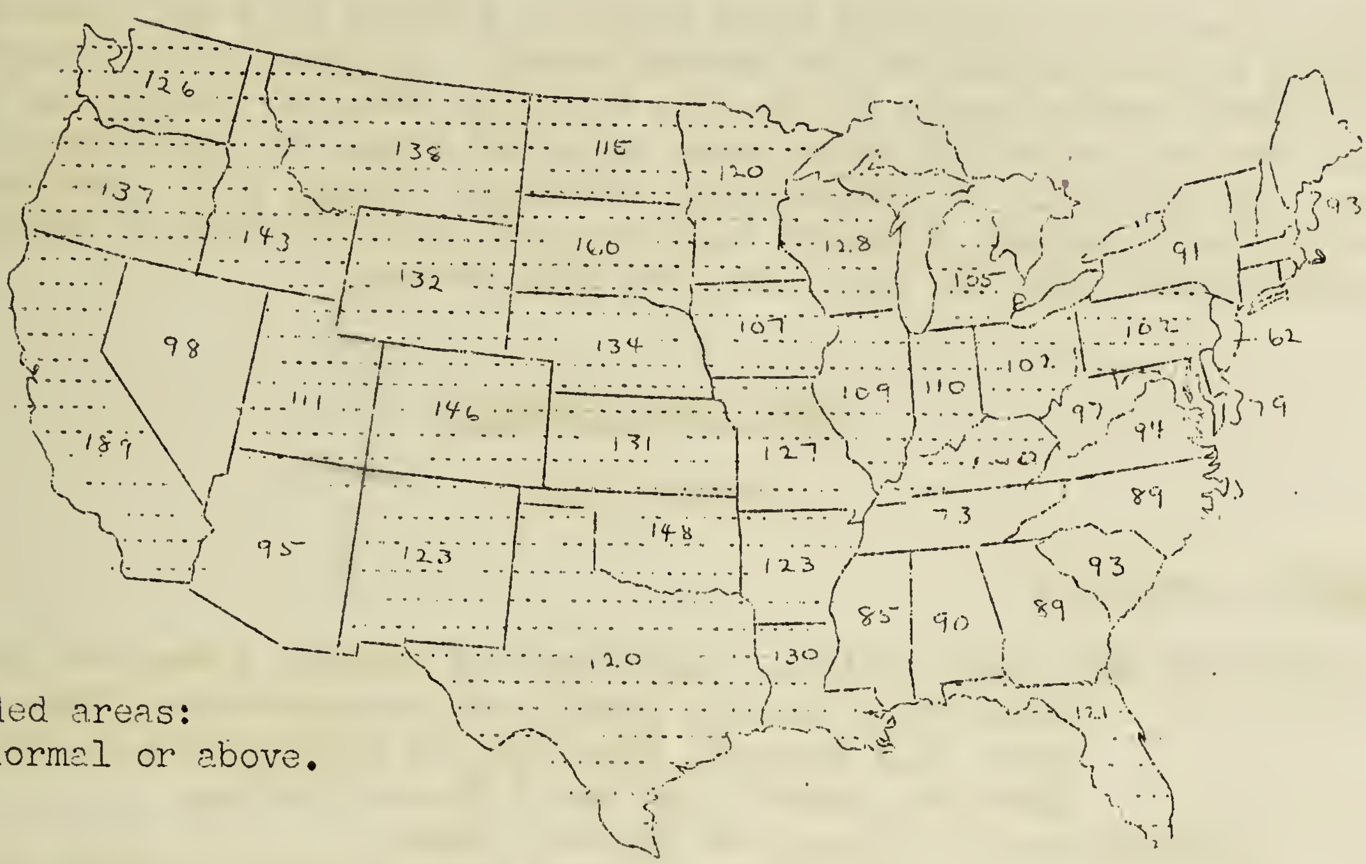
Shaded areas:
normal or above.

Figure 1. -- Percentage of Normal Precipitation by States, June 1942.



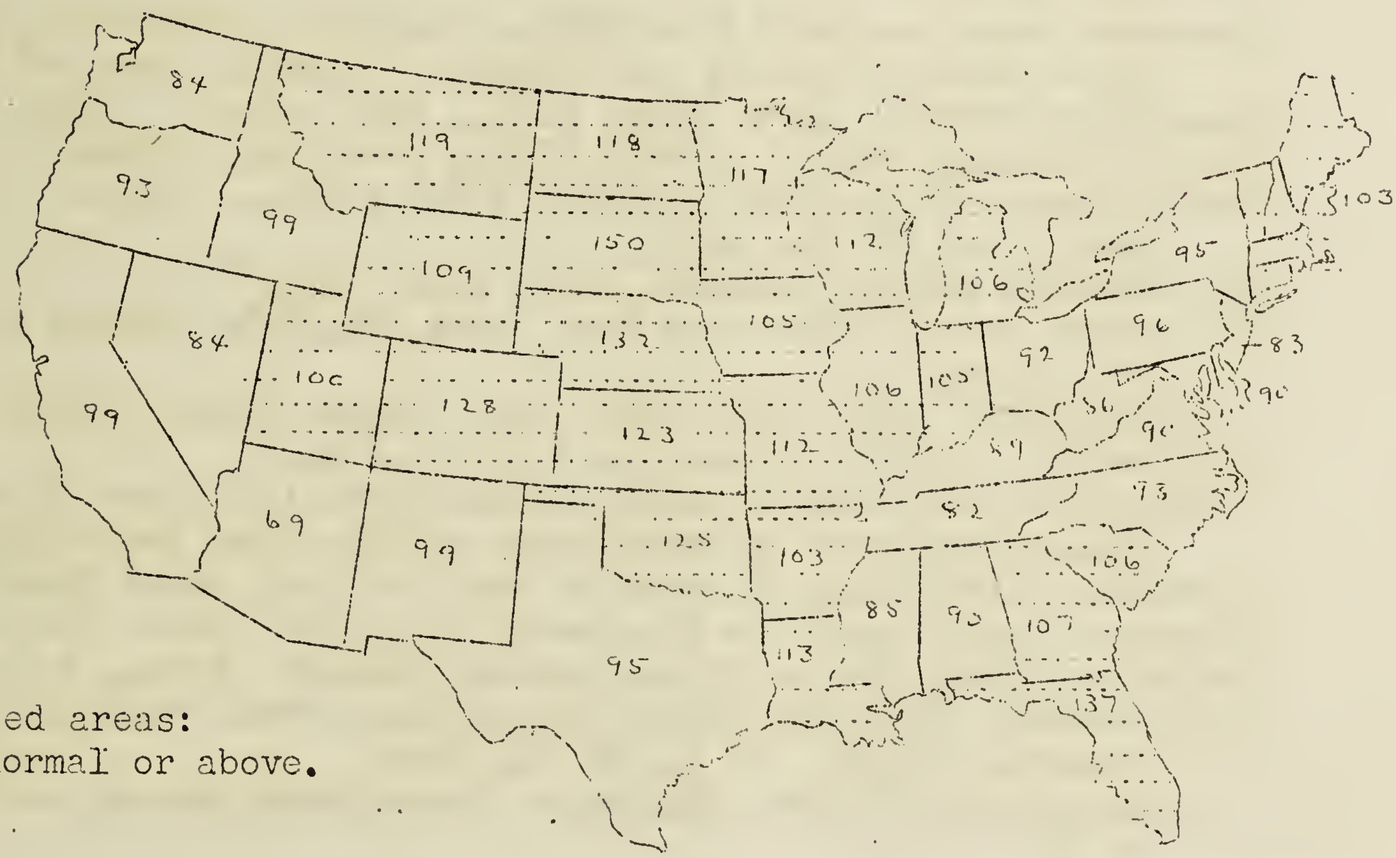
Shaded areas:
normal or above.

Figure 2. -- Percentage of Normal Precipitation by States, May 1942.



Shaded areas:
normal or above.

Figure 3. -- Percentage of Normal Precipitation by States, April - June 1942.



Shaded areas:
normal or above.

Figure 4. -- Percentage of Normal Precipitation by States, January - June 1942.

totals have been relatively heavy from the western Ohio and lower Mississippi Valleys northward and northwestward. An interesting feature of the year's precipitation to date has been the constant and fairly uniform increase in amounts from month to month since the beginning of the year. On the basis of country-wide averages, January had approximately two-thirds of normal, February slightly more than 90 percent, March 102 percent, April 108, May 112, and June 123 percent.

CHECK LIST REVISION

Freeman Weiss

SALIX -- continued

SALIX ALBA L.1/, WHITE WILLOW. Large tree of Europe, grown for ornament (var. tristis Gaud.) and basket-making (var. vitellina (L.) Stokes), Zone II, and naturalized in the Eastern, Central and Great Plains States.

Asteroma capreae Desm., on leaves. Conn.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., branch canker. Ga., Mo.
Cercospora salicina Ell. & Ev., leaf spot. La.
Cryptodiaporthe salicina (Curr.) Wehm., twig & branch canker. Md., N. Y.
Cytospora spp., on twigs & branches, commonly saprophytic, sometimes causing cankers and dieback. Conidial stage of Valsa spp.
Discella carbonacea (Fr.) Berk. & Br., twig canker. Conn.
Fomes applanatus (Pers. ex Fr.) Gill., heart rot. Conn.
Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Conn., Mass., Me., N. H., N. Y.
Gloeosporium salicis Westend., leaf spot. Wis.
Melampsora abieti-capraearum Tub., rust (II,III). Conn., N. Y., Pa., Wash.
M. bigelowii Thüm., rust (II, III). Conn., Nebr., Wash., Wis.
Phyllosticta apicalis Davis, leaf spot. Kans.
Physalospora miyabeana Fukushi, black canker (on leaves & twigs). Conn. (See note on Fusicladium saliciperdum under Salix spp.)
Phytomonas tumefaciens (E.F.S. & Town.) Bergey, crown gall. Conn.
Trametes suaveolens L. ex Fr., wound rot, heart rot. Conn., Me.
Uncinula salicis DC. ex Wint., powdery mildew. Conn., N. Y.
Valsa sordida Nits. (Cytospora chrysosperma Pers. ex Fr.), dieback, canker. N. J., N. Y., Wis.
V. translucens De Not. (Cytospora translucens Sacc.), on twigs. N. Y.

1/ Only the more common native spp. and those of greatest importance in horticulture, forestry, and soil conservation are listed separately here.

SALIX AMYGDALOIDES Anderss., PEACH LEAF WILLOW. Small or sometimes a large tree occurring nearly throughout the northern half of the country except the coast regions.

Cytospora spp. See Valsa.
Daedalea confragosa Bolt. ex Fr., heart rot. Ind., Mass.
Melampsora bigelowii Thüm., rust (II,III). General.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Ind. to Texas.
Rhytisma salicinum Pers. ex Fr., tar spot. S. Dak.
Uncinula salicis DC. ex Wint., powdery mildew. Widespread.
Valsa sordida Nits. (Cytospora chrysosperma Pers. ex Fr.), twig canker. Colo., S. Dak. V. nivea Hoffm. ex Fr., Utah.

SALIX BABYLONICA L., BABYLON WEEPING WILLOW, and S. BLANDA Anders. (S. babylonica x fragilis), WISCONSIN WEEPING W. Ornamental tree of Europe, cult. Zone V (the hybrid in Zone IV). Other spp. also include vars. of pendulous habit.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., branch canker. Md.
Cercospora salicina Ell. & Ev., leaf spot. Md.
Daedalea confragosa Bolt. ex Fr., heart rot. Pa.
Discella carbonacea (Fr.) Berk. & Br., twig canker. Mass., N. Mex. (Conidial stage of Cryptodiaporthe salicina).
Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Mass. On S. blanda.
Ganoderma lucidum (Leyss. ex Fr.) Karst., wood rot. Md.
Macrophoma sp., branch canker. Texas.
Marssonia sp., twig canker. N. Y.
Melampsora abieti-capraearum Tub., rust (II, III). Mo., W. Va.
Physalospora obtusa (Schw.) Cke., on branches. Ga.
Phytomonas tumefaciens (E.F.S. & Town.) Bergey, crown gall. Conn., N. J., Texas.
Valsa salicina Pers. ex Fr. (Cytospora salicis (Cda.) Rabh.), twig canker. Md.
V. sordida Nits. (Cytospora chrysosperma Pers. ex Fr.) Md., N. J., Tenn., N. Mex.

SALIX BEBBIANA Sarg., BEBB WILLOW. Small or sometimes large tree, occurring from N. Y. to Calif. & Wash., chiefly the N. Central and Rocky Mt. States, cult. Zone II; and S. SCOULERIANA Barratt, MOUNTAIN WILLOW; occurring from Mont. to Calif. & Alaska.

Cryptodiaporthe salicina (Curr.) Wehmeyer, branch canker. Va.
Cylindrosporium conservans Pk., leaf spot. Wash.
C. salicinum (Pk.) Dearn. Wis.
Daedalea confragosa Bolt. ex Fr., heart rot. Mont.
Fomes conchatus (Pers. ex Fr.) Karst. and F. igniarius (L. ex Fr.) Kickx, heart rot. Mont., Wash.
Marssonina sp., leaf spot. Wash.

SALIX BEBBIANA, BEBB WILLOW -- continued.

Melampsora abieti-capraearum Tub., rust (II, III). Northern States, Me. to Minn.; Colo. to N. Mex. & Wash.
M. bigelowii Thüm., rust (II, III). Wyo. to Calif. & Wash. On S. scouleriana.
M. ribesii-purpureae Kleb., rust (II, III). Nebr. to N. Mex., Wash. & Alaska. On S. scouleriana.
Myxofusicoccum salicis Died., on branches. Wash.
Nectria cinnabarina Tode ex Fr., on branches. Wash.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.
Ramularia rosea (Fckl.) Sacc., leaf spot. Wis.
Rhytisma salicinum Pers. ex Fr., tar spot. Mont. to N. Mex. & Wash.
Septogloeum salicinum (Pk.) Sacc., leaf spot. Wis.
Uncinula salicis DC. ex Wint., powdery mildew. Colo., Mich., Minn., Mont.
Valsa boreella Karst., V. salicina Pers. ex Fr., and V. sordida Nits., twig canker. Idaho, Mont., Wash.

SALIX CORDATA Muhl., HEARTLEAF WILLOW. Shrub or small tree of Growth Regions 18, 21, 22, 23, 24, 25, 26, 27, 28; Cult. Zone III. Also S. MISSOURIENSIS Bebb, of the central portion of the range, and S. LUTEA Nutt., YELLOW WILLOW, of the Great Plains and Rocky Mt. States.

Cylindrosporium salicinum (Pk.) Dearn., leaf spot. N. Y.
Discella carbonacea (Fr.) Berk. & Br., twig canker. S. Dak.
Fomes conchatus (Pers. ex Fr.) Gill., heart rot. S. Dak.
Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Conn., Mass., N. Y., Pa.
Gloeosporium boreale Ell. & Ev., leaf spot. Vt. (? Cylindrosporium salicinum).
Marssonina kriegeriana (Bres.) Magn., leaf spot. Wis.
Melampsora abieti-capraearum Tub., rust (II, III). Me. to W. Va., Kans. and Mont.
M. bigelowii Thüm., rust (II, III). Reported from various, mostly Western, States, on S. cordata and S. lutea, but not included on these hosts by Arthur.
M. ribesii-purpureae Kleb., rust (II, III). Mont. to Calif. & Oregon. On S. lutea.
Mycosphaerella salicina Ell. & Ev., on twigs. Kans.
Nectria cinnabarina Tode ex Fr., on branches. N. Mex.
Ocellaria ocellata (Pers. ex Fr.) Schroet., on branches. N. Dak.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Wash.
Rhytisma salicinum Pers. ex Fr., tar spot. Widespread.
Septoria salicis Westend., leaf spot. Kans.
Sphaeropsis salicis Ell. & Barth., on branches. Kans.
Uncinula salicis DC. ex Wint., powdery mildew. Widespread.
Valsa boreella Karst., twig canker. Kans.
V. salicina Pers. ex Fr. Mont., S. Dak.

SALIX DISCOLOR Muhl., PUSSYWILLOW. Small tree of Growth Regions 15, 18, 21, 22, 24, 25, 26, 27, 28; cult. Zone II. Including the "pussy willows" of florists, S. CAPREA L., GOAT WILLOW, and S. CINEREA L., GRAY WILLOW; small trees of Europe, cult. for ornament, respectively in Zones IV and II.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., branch canker. Va. to Ga. & Ark.
(Cytospora chrysosperma Pers. ex Fr.): Valsa sordida.
Daedalea confragosa Bolt. ex Fr., heart rot. Minn.
Diplodina sp. (? conidial stage of Cryptodiaporthe salicina), twig canker. Mass.
Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Conn.
Macrophoma sp. on branches, ? canker. Ark., Miss., N. & S. Car.
Marssonina kriegeriana (Bres.) Magn., leaf spot. Wis.
Melampsora abieti-capraearum Tub., rust (II, III). Me. to Va. & Minn.
M. bigelowii Thüm., rust (II, III). Me. to Ind. & Minn.
Myrioconium comitatum Davis, var. salicarium Davis, leaf spot. Wis. (Spermatial stage of Sclerotinia foliicola ?)
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Md.
Ramularia rosea (Fckl.) Sacc., leaf spot. Wis.
Rhytisma salicinum Pers. ex Fr., tar spot. Mich.
Septogloeum salicinum (Pk.) Sacc., leaf spot. Wis.
Uncinula salicis DC. ex Wint., powdery mildew. Widespread.
Valsa sordida Nits., twig canker, dieback. N. J., N. Y., Ohio, Wis.

SALIX FRAGILIS L., CRACK WILLOW. Large tree of Europe, cult. Zone II, and locally naturalized in the Eastern States.

Cylindrosporium salicinum (Pk.) Dearn., leaf spot. Wis.
Cytospora chrysosperma Pers. ex Fr., twig canker. Mass.
Daedalea confragosa Bolt. ex Fr., heart rot. Mass.
Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Mass., N. Y.
Gloeosporium salicis Westend., leaf spot. Wis.
Marssonina sp., leaf spot. Ga., Mass.
Melampsora abieti-capraearum Tub., rust (II, III). Ill., N. Y., Pa.
Septoria didyma Fckl., leaf spot. Wis.
Uncinula salicis DC. ex Wint., powdery mildew. Mass., N. Y.
Valsa sordida Nits., on branches, canker. Mass.
V. translucens De Not. S. Dak.

SALIX INTERIOR Rowl., SANDBAR WILLOW. Thicket-forming shrub or small tree, characteristic of river banks and shoals, in the Eastern, Southern and especially the Central States; also S. EXIGUA Nutt. of the Western, and S. FLUVIATILIS Nutt. of the Pacific Coast States.

SALIX INTERIOR, SANDBAR WILLOW -- continued.

Cercospora salicina Ell. & Ev., leaf spot. La.
Coryneum salicinum (Cda.) Sacc., on branches. N. Dak.
Cryptodiaporthe salicina (Curr.) Wehmeyer, branch canker. Miss., S. Dak.
Cytospora spp., twig canker. See Valsa.
Daedalea confragosa Bolt. ex Fr., heart rot. Mo., S. Dak.
Discula brenckleana (Sacc. & Syd.) Petr. (Macrophoma salicis Dearn. & Barth.), on branches. Mont., N. & S. Dak.
Fomes conchatus (Pers. ex Fr.) Gill., heart rot. N. Dak.
Gibberella acervalis (Moug.) Sacc., on dead stems. Idaho.
Gloeosporium salicis Westend., leaf spot. N. Y., Wis.
Hypoxylon morsei Berk. & Curt., branch canker. Iowa.
(Macrophoma brenckleana Sacc. & Syd. and M. salicis Dearn. & Barth.): Discula brenckleana on branches.
Marssonina kriegeriana (Bres.) Magn., leaf spot. Wis., Wyo.
Melampsora abieti-capraearum Tub., rust (II, III). Md. to Miss., Texas & Wash.
M. bigelowii Thüm., rust. Mont. to N. Mex. & Wash. On S. exigua and S. fluviatilis.
Myrioconium comitatum var. salicarium Davis, leaf spot. Wis.
Nectria cinnabarina Tode ex Fr., on branches. N. Mex.
Rhytisma salicinum Pers. ex Fr., tar spot. Colo., Mont., N. & S. Dak., Wyo.
Sphaerulina salicina Syd. (? Griphosphaeria corticola (Fckl.) Höhn.), on branches. N. Dak.
Uncinula salicis DC. ex Wint., powdery mildew. Mich., Mont., Nebr.
Valsa spp., twig canker, dieback. V. boreella Karst. and V. nivea Hoffm. ex Fr., Kans.; V. salicina Pers. ex Fr., V. sordida Nits., N. Dak.; V. translucens De Not., Idaho, N. Dak.

SALIX LAEVIGATA Bebb, RED WILLOW and S. LASIANDRA Benth., PACIFIC W. Small to large trees of the Far Western States, corresponding to the black willow of the East.

Fomes igniarius (L. ex Fr.) Kickx, heart rot. Wash.
Marssonina sp., twig blight. Oregon.
M. apicalis (Ell. & Ev.) Magn., leaf spot. Calif.
Melampsora bigelowii Thüm., rust (II, III). Mont. to N. Mex., Calif. and Wash.
M. ribesii-purpureae Kleb., rust (II, III). Nev.
Rhytisma salicinum (Pers. ex Fr.), tar spot. Wash.
Septogloeum salicis-fendlerianae Dearn. & Barth., leaf spot. Idaho, Mont., Wyo.
Taphrina aurea Fr., leaf blister. Calif.
Uncinula salicis DC. ex Wint., powdery mildew. Calif.
Valsa sordida Nits., canker, dieback. Idaho.

SALIX LASIOLEPIS Benth., ARROYO WILLOW. Small to large tree occurring in the Pacific Coast and Southwestern States.

Cryptosporium sp., branch canker. Calif.

Marssonina apicalis (Ell. & Ev.) Magn. and M. nigricans (Ell. & Ev.) Magn., leaf spot. Calif.

Melampsora bigelowii Thüm., rust (II, III). Calif.

M. ribesii-purpureae Kleb., rust (II, III). Ariz., Calif., Oregon, Wash.

Septogloeum maculans Hark., leaf spot. Calif.

Septoria rhabdocarpa Ell. & Barth., on leaves. Calif.

Uncinula salicis DC. ex Wint., powdery mildew. Calif.

Valsa sordida Nits., canker. Calif.

SALIX LUCIDA Muhl., SHINING WILLOW. Small tree of Eastern and N. Central States, cult. Zone II. Also S. PENTANDRA L., BAY OR LAUREL W., large tree of Europe, naturalized in Eastern States, cult. Zone IV.

Cylindrosporium salicinum (Pk.) Dearn., leaf spot. Mass. to Mich. and Iowa.

Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Conn., Me.

Gloeosporium salicis Westend., leaf spot. Ill., Wis.

Lophodermium versicolor (Wahlenb. ex Fr.) Rehm, on leaves. Pa.

Marssonina apicalis (Ell. & Ev.) Magn., leaf spot. Wis.

Melampsora abieti-capraearum Tub., rust (II, III). Me. to Wis. On S. lucida.

M. bigelowii Thüm., rust (II, III). N. Y., Pa. On S. pentandra.

Phyllosticta apicalis Davis, leaf spot. Wis.

Ramularia lucidae Davis, leaf spot. Wis.

Rhytisma salicinum Pers. ex Fr., tar spot. Iowa, Me., Mich., N.Y.

SALIX NIGRA L., BLACK WILLOW. Large tree, commonly along streams in the Eastern, Central and Southern States to the Great Plains.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., branch canker. Ga., W. Va.

Cercospora salicina Ell. & Ev., leaf spot. La., Texas.

Cryptodiaporthe salicina (Curr.) Wehmeyer, branch canker. Ga.

Cuscuta gronovii Willd., dodder. N. Y.

Cytospora spp., twig & branch canker. See Valsa.

Daedalea ambigua Berk., wood rot. Ga.

D. confragosa Bolt. ex Fr., wood rot, often of living trees. Widespread.

Diplodia salicina Lév. (? D. sarmentorum Fr.), on dead branches. W. Va.

Fomes spp., heart rot. Occasional. Spp. reported include F. applanatus (Pers. ex Fr.) Gill., F. connatus (Weinm. ex Fr.) Gill., F. igniarius (L. ex Fr.) Kickx.

Fusicladium saliciperdum (Allesch. & Tub.) Tub., blight. Conn., Mass., N. Y.

SALIX NIGRA, BLACK WILLOW -- continued.
Gloeodes pomigena (Schw.) Colby, on branches. Ind.
Helicobasidium purpureum (Tul.) Pat., root rot. Texas.
Marssonina salicina Tehon, leaf spot. Ill.
Melampsora abieti-capraearum Tub., rust (II, III). General.
M. bigelowii Thüm., rust (II, III). Reports numerous throughout the range but this species is not listed as a host by Arthur in North American Flora.
Melanconium sp., twig canker. Colo.
M. salicinum Ell. & Ev., on twigs. La.
Phoma sp. and P. platysperma Pk., on twigs. Ill., W. Va.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Ind., Texas. Var. macrophyllum Engelm., Ariz., N. Mex.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Phytomonas tumefaciens (E.F.S. & Town.) Bergey, crown gall. Conn., Texas.
Pleurotus ulmarius Fr., wound rot. N. Car.
Polyporus spp., wood rot, sometimes of living trees. Spp. reported include P. crocatus (Fr.) Lév., La.; P. hirsutus Wulf. ex Fr., N. Car.; P. squamosus Huds. ex Fr., Mass.; P. unitus Pers., Mich., N. Y.; P. versicolor L. ex Fr., La.
Poria ambigua Bres., wood rot. Md., Texas. P. andersonii (Ell. & Ev.) Neuman, Md.
Rhytisma salicinum Pers. ex Fr., tar spot. Miss., Texas.
Trametes hispida Bagl., trunk rot. Ark., La.
Uncinula salicis DC. ex Wint., powdery mildew. Widespread.
Valsa salicina Pers. ex Fr. (Cytospora salicis (Cda.) Rabh.), twig & branch canker. Ala., Nebr., W. Va.
V. sordida Nits. (Cytospora chrysosperma Pers. ex Fr.). Nev.
V. translucens De Not. Ind.

SALIX SERICEA Marsh., SILKY WILLOW. Shrub or small tree of Growth Regions 21 to 27; cult. Zone III.
Cryptomyces maximus (Fr.) Rehm, blister canker.
Fusicladium saliciperdum (Allesch. & Tub.) Tub., shoot blight. Conn., N. Y.
Melampsora abieti-capraearum Tub., leaf rust (II, III). Conn., Ind., N. Y., Va.
Septogloeum salicinum (Pk.) Sacc., leaf spot. N. Y.
Septomyxa grisea Dearn. & House, on twigs. N. Y.
Uncinula salicis DC. ex Wint., powdery mildew. Ind.

SALIX VIMINALIS L., COMMON OSIER and S. PURPUREA L., PURPLE OSIER. Shrubs or small trees of Europe and Asia, grown for basket-making and ornament. Zones III & IV; the former naturalized in the Eastern States.
Cryptomyces maximus (Fr.) Rehm, blister canker.
Cryptosphaeria populina Pers. ex Sacc., on dead branches. Pa.
Cytospora salicis (Cda.) Rabh., on twigs. Calif.
Melampsora abieti-capraearum Tub., leaf rust (II, III). N.Y., Pa.
Nectria cinnabarina Tode ex Fr., on twigs. Alaska.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY.)

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IN THIS ISSUE

CHECK LIST REVISION

Freeman Weiss

SAMANEA (LEGUMINOSAE)

SAMANEA SAMAN Merrill, RAIN-TREE, SAMAN. Large tree of West Indies and C. America, grown for ornament.

Heterodera marioni (Cornu) Goodey, root knot. Fla.
Hypomyces haematococcus (Berk. & Br.) Wr., on bark. T. H.
Micorstroma pithecolobii Lamkey, leaf spot. P. R.

SAMBUCUS (CAPRIFOLIACEAE)

SAMBUCUS CAERULEA Raf., BLUEBERRY ELDER, including var. VELUTINA (Durand) Schwer., VELVETLEAF ELDER. Large shrub or small tree of Growth Regions 1,2,4,5,6,7,8,9,11,12,13, 14; cult. for ornament, Zone V, and furnishes food for wild life.

Cercosporella prolificans (Ell. & Holw.) Sacc., leaf spot. Calif., Oreg., Alaska.
Coryneum sambucinum Ell. & Ev., on branches. Colo., Nev.
Cytospora chrysosperma Pers. ex Fr., canker, dieback. Wash. Conidial stage of Valsa sordida.
Diaporthe sociabilis Nits. var. sambuci (Ell. & Ev.) Wehmeyer, on branches. Wash.
Exosporium sambuci Tracy & Earle, on branches. Wash.
Fomes igniarius (L. ex Fr.) Kickx, heart rot. Idaho.
Hendersonia diplodioides Ell. & Ev., on branches. Utah, Wash.
Hymenochaete agglutinans Ell. & H. rubiginosa (Schrad. ex Fr.) Lév., trunk rot. Wyo.
Leptosphaeria sambuci Fautr., on branches. Oregon.
Nectria cinnabarina Tode ex Fr. (N. sambuci Ell. & Ev.), canker, dieback. Idaho, Nebr., Wash.
N. coccinea Pers. ex Fr. Idaho.
Phyllosticta sambuci Desm., leaf spot. Mont.
Polyporus spp., wood rot (probably saprophytic). Spp. reported include P. caesius Schrad. ex Fr., Calif., Oregon; P. chioneus Fr., Wash.; P. picipes Fr., Wash.; P. planellus (Murr.) Overh., Idaho; P. versicolor L. ex Fr., Wash.
Ramularia glauca Ell. & Ev., leaf spot. Calif.
R. sambucina Sacc. Calif., Wash.
Septoria sambucina Pk., leaf spot. Calif., Oregon, Wash.
Sphaeropsis sambucina (Cke.) Sacc., on branches. Calif., Mont.
Stereum purpureum Pers., wood rot. Calif.

SAMBUCUS -- continued.

SAMBUCUS CANADENSIS L., AMERICAN ELDER. Large shrub occurring throughout the Eastern and Central States; grown for ornament and edible fruit, Zone III. Forms with vari-colored fruit and dissected leaves are in cult. Also SAMBUCUS MELANOCARPA Gray, BLACKBEAD ELDER of Growth Regions 4, 9, 10, 12, 13 & 14; cult. Zone V.

Ascochyta wisconsina Davis, leaf spot. N. Y., Wis.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug. and var. chromogena Shear et al., on branches. Fla., Ga.
Cercospora catenospora Atk., leaf spot. Ala., Kans., Miss., N. Car., Texas.
C. depazeoides (Desm.) Sacc. Me. to Ala., Kans. & Wis.
Cercosporella prolificans (Ell. & Ev.) Sacc., leaf spot. N. Mex.
Coryneum sambucinum Ell. & Ev., on branches. Colo.
Cryptospora pulviniceps (Pk.) Sacc., on branches. N. Y.
Cytospora sambucicola Tehon & Stout, branch canker. Ill.
C. sambucina Ell. & Barth., on branches. Kans., N. Y.
Diaporthe megalospora Ell. & Ev., on branches. Ga., Mass., N. Y.
D. sociabilis Nits. var. sambuci (Ell. & Ev.) Wehmeyer, Ga., La., Mich.
Diplodia spp., on branches, ? canker & dieback. Spp. reported include D. natalensis Pole-Evans, Ala., Texas; D. paupercula Berk. & Br., N. Y.; D. sambuci Tehon & Daniels, Ill.; D. sambucina Sacc., N. Y.
Diplodina deformis (Karst.) Sacc., on twigs. Wash.
(Dothidea sambuci Pers. ex Fr.): Systremma natans.
Dothiorella macrospora (Berk. & Curt.) Sacc., on branches. Mich., Pa.
Exosporium sambuci Tracy & Earle, on dead branches. Colo.
Gloeosporium tineum Sacc., on leaves. Miss., Texas.
Glomerella cingulata (Ston.) Spauld. & Schrenk, on branches. La.
Haplosporella sambuci (Pk.) Petr., on branches, ? canker. Ind., N. Y., N. Dak.
Helicobasidium purpureum (Tul.) Pat., root rot. Texas.
Heterosporium sambuci Earle, on dead branches. Ala.
Lasmeniella alpina (Ell. & Ev.) Petr. & Syd., on branches. Colo.
Leptosphaeria sambucina Ell. & Ev., on branches. Colo.
Leptothyrium pomi (Mont. & Fr.) Sacc., on twigs. Va.
Microsphaera alni DC. ex Wint., M. grossulariae Wallr. ex Lév., powdery mildew. Widespread. The latter sp. is more frequently reported.
Nectria cinnabarina Tode ex Fr., twig canker, dieback. Widespread.
N. coccinea Pers. ex Fr., canker. Md., Mich., Wash.
Phomopsis sp., on twigs. Idaho.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.
Phyllosticta sambuci Desm., leaf spot. Ind., N. Y., Pa., W. Va., Wis.

SAMBUCUS CANADENSIS -- continued.

Phyllosticta sambucicola Kalchbr. Ind.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora fusca N. E. Stevens and P. rhodina (Berk. & Curt.) Cke., on branches. N. Y.
Puccinia bolleyana Sacc., rust (O, I). Me. to Fla., Texas & Minn. II & III on Carex spp.
Ramularia sambucina Sacc., leaf spot. Mo., N. Y.
Septoria sambucina Pk., leaf spot. Vt. to Fla., Texas & Wis.
(Sphaeropsis sambuci Pk.): Haplosporella sambuci.
S. sambucina (Cke.) Sacc., on branches, ? canker. Kans. (Possibly the same as Lasmeniella (Haplosporella) alpina.)
Sphaerulina sambucina Pk., on branches. N. Y.
Systremma natans Tode ex Theiss. & Syd., on branches. N. Y.
Xylaria ? multiplex Kze., root rot. Texas.

Mosaic, suspected virus. Fla., Pa.

SAMBUCUS NIGRA L., EUROPEAN ELDER. Large shrub or small tree of Europe, cult. for fruit and ornament, Zone V.

Ascochyta sambuci Sacc., leaf spot. Alaska.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Ga.
Cercospora depazeoides (Desm.) Sacc., leaf spot. Iowa, Me.
Puccinia bolleyana Sacc., rust (O, I). Mass.
Sphaeropsis sambucina (Cke.) Sacc., on branches. Calif.

SAMBUCUS PUBENS Michx. (S. racemosa auths. not L.), SCARLET ELDER. Large shrub of Growth Regions 15, 21, 22, 23, 24, 26, 27, 28; cult. for ornament in several hort. vars., Zone IV. Including S. CALLICARPA Greene, PACIFIC ELDER, of G. R.'s 1, 2 & 4.

Ascochyta wisconsina Davis, leaf spot. Wis.
Cercospora lateritia Ell. & Hals., leaf spot. Iowa.
C. depazeoides (Desm.) Sacc. Wash.
Cryptodiaporthe calosphaerioides (Ell. & Ev.) Wehmeyer, on branches. Alaska.
Diaporthe sociabilis Nits. var. sambuci (Ell. & Ev.) Wehmeyer, on branches. Wash. (D. callicarpae Pk.)
Diplodia paupercula Berk. & Br., on branches. Va.
Hendersonia pubentis Cke., on branches. N. Y.
Microsphaera grossulariae Wallr. ex Lév., powdery mildew. Vt. to Pa. & Wis.
Nectria cinnabarina Tode ex Fr., canker, dieback. Alaska, Calif., Va.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Puccinia bolleyana Sacc., rust (O, I). Mass. to Ind. & Mich.
Ramularia sambucina Sacc., leaf spot. N. Mex., N. Y., Pa., Wis.
Septoria sambucina Pk., leaf spot. Calif., Wash., Wis.

SAMBUCUS, unnamed spp.

Corticium microsclerotia Weber, web blight. Fla. On S. simpsonii Rehd.

C. stevensii Burt, thread blight. La.

Daedalea unicolor Bull. ex Fr., on trunks. Wis.

Dendrophoma sambuci (Berk. & Curt.) Sacc., on branches. Me.

Fomes scutellatus Schw. ex Cke., on trunks. Md.

Hymenochaete agglutinans Ell., on trunks. Wyo.

Mycosphaerella sp., leaf spot. N. Mex.

Myxosporium sp., on twigs. Wash.

Physalospora obtusa (Schw.) Cke., on branches. Ala., N. Y., Va.

Sphaerotheca humuli DC. ex Burr., powdery mildew. Mass.

Thyronectria sambucina Ell. & Ev., on dead branches. Colo.

Verticillium albo-atrum Reinke & Berth., wilt. Md.

Leaf curl, mite (Eriophyes sp.). N. Y., Tenn.

SAPINDUS (SAPINDACEAE)

SAPINDUS DRUMMONDII Hook. & Arn., WESTERN SOAPBERRY. Deciduous shrub or small tree of Growth Regions 11, 16, 17, 19, 20, 22, 25, 29, 30. Including S. MARGINATUS Willd., FLORIDA SOAPBERRY. Both spp. grown for ornament, Zone V.

Cylindrosporium griseum Heald & Wolf, leaf blight. Okla., Texas.

Glomerella cingulata (Ston.) Spauld. & Schrenk (Colletotrichum gloeosporioides Penz.), leaf spot, dieback. Texas.

Helicobasidium purpureum (Tul.) Pat., root rot. Texas.

Mycosphaerella sapindi (Ell. & Ev.) Lindau, leaf spot. Mo.

Phoradendron flavescens (Pursh) Nutt. and var. macrophyllum Engelm., mistletoe. Ariz., N. Mex., Texas.

Phymatotrichum omnivorum (Shear) Dug., root rot. Okla., Texas. (Reported resistant.)

Uncinula circinata Cke. & Pk., powdery mildew. Texas.

Mosaic, suspected virus. Texas.

SAPINDUS SAPONARIA L., SOUTHERN SOAPBERRY. Evergreen tree of tropical America, grown for ornament and production of saponion (in fruits); including S. MUKOROSII Gaertn. var. CARINATUS Radlk., CHINESE SOAPBERRY, S.E. Asia, cult. in Zone VII.

Corticium stevensii Burt, thread blight. Fla.

Glomerella cingulata (Ston.) Spauld. & Schrenk, leaf spot, dieback. Fla.

Meliola sapindacearum Speg. and M. sapindii F. L. Stevens, black mildew. Canal Zone, P. R.

Phyllosticta sapindi P. Henn., leaf spot. Fla.

SAPIUM (EUPHORBIACEAE)

SAPIUM SEBIFERUM Roxb., CHINESE TALLOWTREE. Small tree of China, cult. for ornament and wax, Zone VII, and locally naturalized in the Gulf States.
Cercospora stillingiae Ell. & Ev., leaf spot. La.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Phyllosticta stillingiae Ell. & Ev., leaf spot. La.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

SARCOBATUS (CHENOPODIACEAE)

SARCOBATUS VERMICULATUS (Hook.) Torr., GREASEWOOD. Shrub characteristic of alkaline soil areas of Growth Regions 6, 7, 8, 9, 10, 11, 12, 15; furnishes wood and is sometimes grown for ornament, Zone V.
Hendersonia heterophragmia Ell. & Ev., on twigs. Mont.
Puccinia aristidae Tracy, rust (0, I). Nebr. to Calif. and Wash.
II and III on Aristida and other grasses.
P. luxuriosa Syd., rust (0, I). Mont. to Ariz., Calif. and Oregon.
II and III on Sporobolus airoides.
Septoria sarcobati Dearn. & Barth., on involucres. Mont.
Stereum purpureum Pers., on branches. Calif.

SASSAFRAS (LAURACEAE)

SASSAFRAS ALBIDUM (Nutt.) Nees, SASSAFRAS. Shrub to small or large tree of Growth Regions 20, 22, 23, 24, 25, 26, 27, 28, 29, 30; grown for wood and ornament, Zone IV.
Actinothyrium gloeosporioides Tehon, leaf spot. Ill.
Apioporthe corni Wehmeyer, on dead twigs. Pa.
Armillaria mellea Vahl. ex Fr., root rot. Pa.
Cryptovalsa sassafras (Ell. & Ev.) Berl., on branches. N. J.
Cytospora sassafras Ell. & Ev., on twigs. Mich., N. Y., W. Va.
C. sassafrasicola Tehon & Daniels. Ill.
Daedalea confragosa Bolt. ex Fr., trunk rot. Ind., N. Y.
Daldinia vernicosa (Schw.) Ces. & De Not., wood rot. Ga., Va.
Diaporthe biglobosa (Cke. & Ell.) Sacc., on branches. N. J.
D. pardalota (Mont.) Fckl. (D. sassafras Dearn. & House). N. Y.
Diplodia spp., on twigs & branches, associated with cankers & dieback. Spp. reported include D. officinalis Ell. & Ev., Mich., N. Y.; D. sassafras Tracy & Earle, Miss.; D. subcuticularis Dearn. & House, N. Y.
Diplopeltis sassafrasicola Tehon & Stout, on leaves. Ill.
Fomes igniarius (L. ex Fr.) Kickx, white heart rot. Ohio, Va.
F. ribis (Schum. ex Fr.) Cke., red heart rot. Mo.
Gloeodes pomigena (Schw.) Colby, on twigs. Ind.

SASSAFRAS ALBIDUM -- continued.

Gnomonia sassafras Ell. & Ev., on leaves. N. J., Ohio.
Griphosphaeria corticola (Fckl.) Höhn., on branches. N. J.
Hymenochaete agglutinans Ell., wood rot. Va.
Hypoxylon spp., especially H. sassafras (Schw. ex Fr.) Berk., wood rot. N. Y. to Ga. & Mo.
Leptothyrium kellermanii Bubák, on leaves. Ohio. (Spermatial stage of Mycosphaerella sassafras ?)
Metasphaeria sassafrasicola Tehon & Stout, on leaves. Ill.
Mycosphaerella sassafras (Ell. & Ev.) Bubák & Kabát, on leaves. N. Y. to Ga. and Kans.
Nectria sp., (? galligena Bres.), branch & trunk canker. Conn. to W. Va.
N. verrucosa (Schw.) Sacc., on branches. Pa.
Nummularia microplaca (Berk. & Curt.) Cke., on branches. Md. to Ala. & Ind.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.
Phyllosticta illinoensis Tehon & Daniels, leaf spot. Ill., Mass.
P. sassafras Cke., leaf spot. N. Y. to Ga., Texas and Ill.
Physalospora obtusa (Schw.) Cke., on branches, ? canker & dieback. N. Y. to Ga. and Miss.
P. fusca N. E. Stevens and P. rhodina (Berk. & Curt.) Cke., on branches. Ala.
Polyporus spp., wood rot, sometimes on living trees. P. gilvus Schw. ex Fr., Ind., La.,Md.; P. hirsutus Wulf. ex Fr., Ind., N. Car.; P. versicolor L. ex Fr., Ind., Md., Va.
Poria ferruginosa (Schrad. ex Fr.) Cke., wood rot.
Pseudodictya sassafrasicola Tehon & Stout, on leaves. Ill.
Schizophyllum commune Fr., wood rot. Pa., Va.
Septoria sp., leaf spot. N. Y.
Sphaeropsis spp., on branches, sometimes associated with cankers and dieback. Occasional, N. Y. to Ala. & Mo. (Probably the conidial stage of Physalospora spp., as S. seriata Pk. and S. punctata Dearn. & House = P. obtusa. S. sassafras Cke. & Ell. is distinct, though probably not a Sphaeropsis).
Stigmatophragmia sassafrasicola Tehon & Stout, on leaves. Ill.
Trametes sepium Berk., wood rot. Ind.
Valsa spp., on branches, probably saprophytic and none connected definitely with the Cytospora spp. listed. Spp. reported include V. ceratophora Tul., N. J.; V. laurina Cke. & Ell., N. J.; V. subclypeata Cke. & Pk., N. Y., Va.
Valsaria nigrofacta (Cke. & Ell.) Sacc. N. J.

Mosaic, suspected virus. N. Y.
Yellows, suspected virus. Texas.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

INCIDENCE OF EAR ROTS IN THE 1941 CORN CROP

Neil E. Stevens

Evidence derived from reports of licensed inspections at terminal markets indicates that on the whole in the commercial corn crop of 1941, there was slightly less loss from ear rots than in the previous year; although these losses were much greater than in the crops of 1938 and 1939. In a few States, notably Illinois, losses seem to have been much greater in 1941 than in any other recent year.

Ear Rots in Corn at Terminal Markets. The results of licensed inspections of shelled corn received at various terminals during June 1942 were made available, as in previous years, through the courtesy of the Grain, Feed, and Seed Branch, Agricultural Marketing Administration, U. S. Department of Agriculture. The method of assembling information, and the reasons for considering total damage in June receipts a fairly reliable index of losses due to ear rots in the corn crop of the previous season, were explained in earlier reports (PDR 19:71-93 and 20:63-71, 316-320).

On the map, Figure 1, A, are shown all the markets receiving over 50 cars of shelled corn during June, 1942. It is recognized that markets such as Chicago and Buffalo may receive shipments from a wide area. The figures indicate the percentage of cars of shelled corn with 5% or over "total damage" received during the month at Buffalo, New York; Toledo, Mansfield, Circleville, Ohio; Louisville, Owensboro, Kentucky; Nashville, Tennessee; Birmingham, Alabama; Indianapolis, Terre Haute, Indiana; Chicago, Peoria, Decatur, Champaign, East St. Louis, Illinois; Milwaukee, Superior, Wisconsin; Duluth, Minneapolis, Minnesota; Cedar-Rapids, Clinton, Keokuk, Sioux City, Iowa; St. Louis, St. Joseph, Kansas City, Missouri; Omaha, Lincoln, Nebraska; Kansas City, Topeka, Kansas; and Denver, Colorado.

The average percentage of cars having 5% or over total damage for all those terminals is 20, as compared to 23 for the previous year, and in sharp contrast with an average of 2.8% for all the markets reporting on the 1939 crop (Fig.2).

Losses From Corn Ear Rots in Illinois. There is abundant evidence that losses from corn ear rots were unusually high in Illinois in 1941. In the report of the Corn Performance Tests[1] it is stated that, "In 1941 ear rots caused more damage in Illinois than in any year since 1934. Widespread and severe kernel damage occurred on ten of the twelve test fields. Only Greenfield and Modoc, in the southwestern area of the State, escaped unusual damage." The contrast between the 2 years just past is evident from the fact that the average kernel damage from rot on all 12 of the Corn Performance Test fields was 4.94% in 1941 and 2.57% in 1940. The difference in the distribution of losses within the State is shown in Figures 3 and 4.

1/ Copper, R. R., G. H. Dungan, A. L. Lang, J. H. Bigger, Benjamin Koehler, and Oren Bolin; Illinois corn performance tests, 1941. Illinois Agr. Exp. Stat. Bul. 482, p. 480.

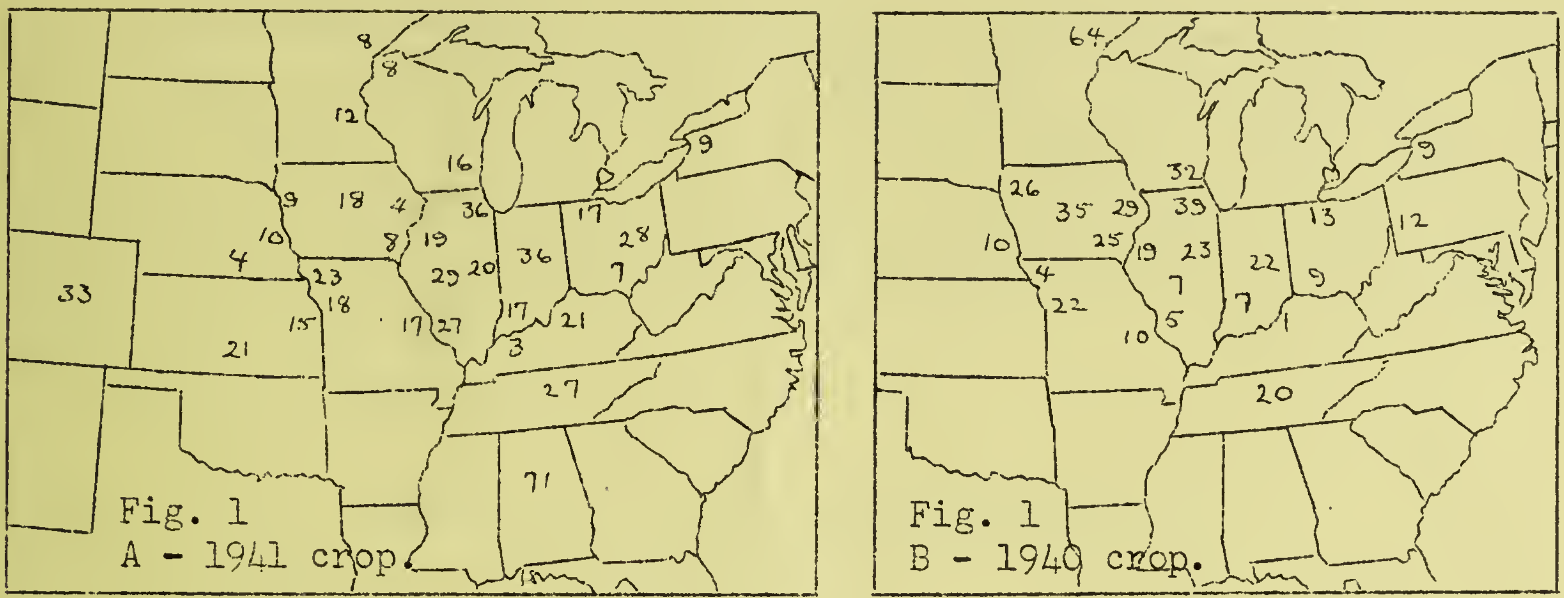

Figure 1. - A. Percentage of cars of shelled corn showing 5% or over total damage. June 1942 receipts, 1941 crop. (For location of markets, see text.)

B. June 1941 receipts, 1940 crop.

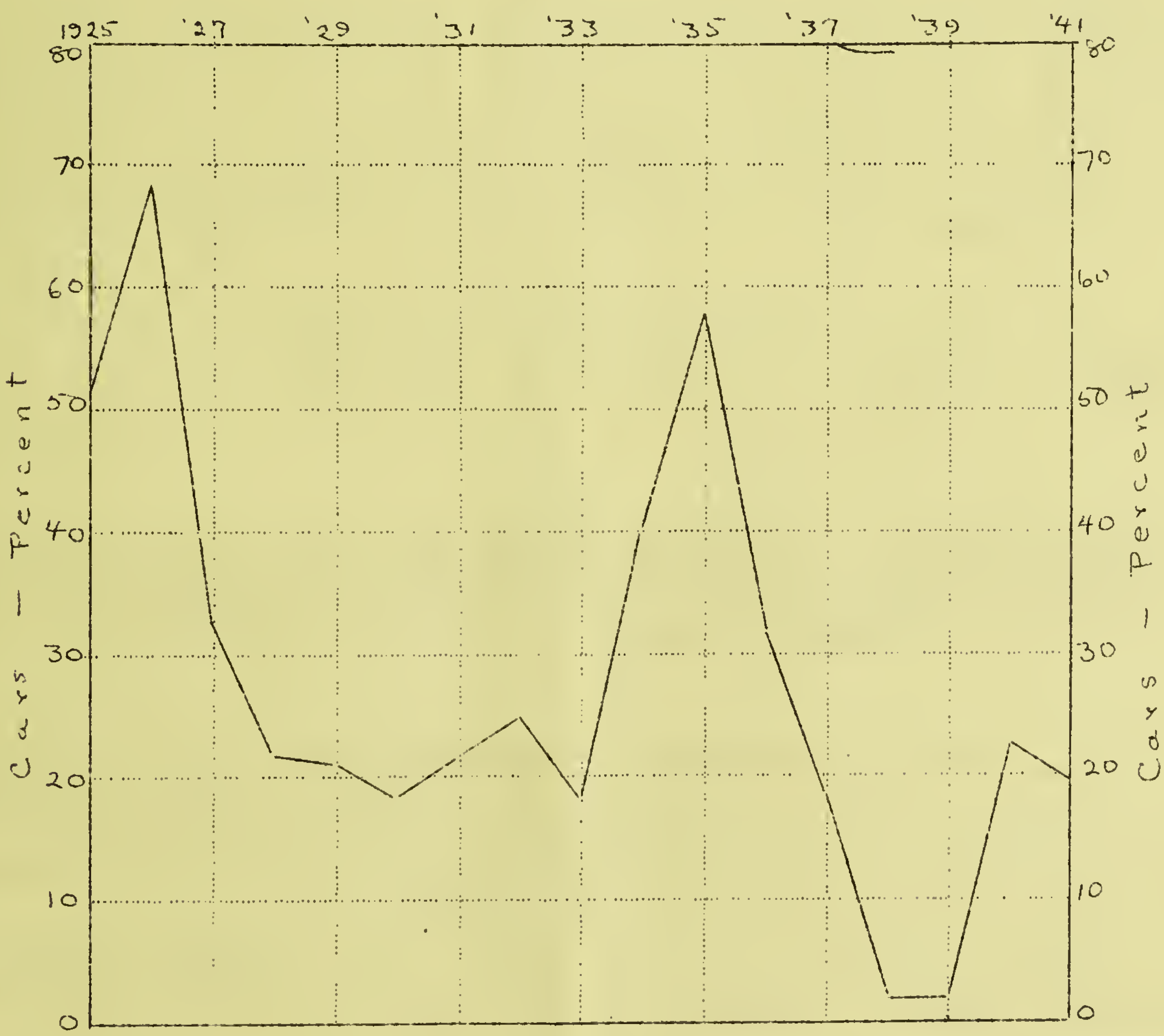

Figure 2. Incidence of corn ear rots in the various crops as indicated by percentage of cars of shelled corn showing 5% or over total damage in June of the following year.

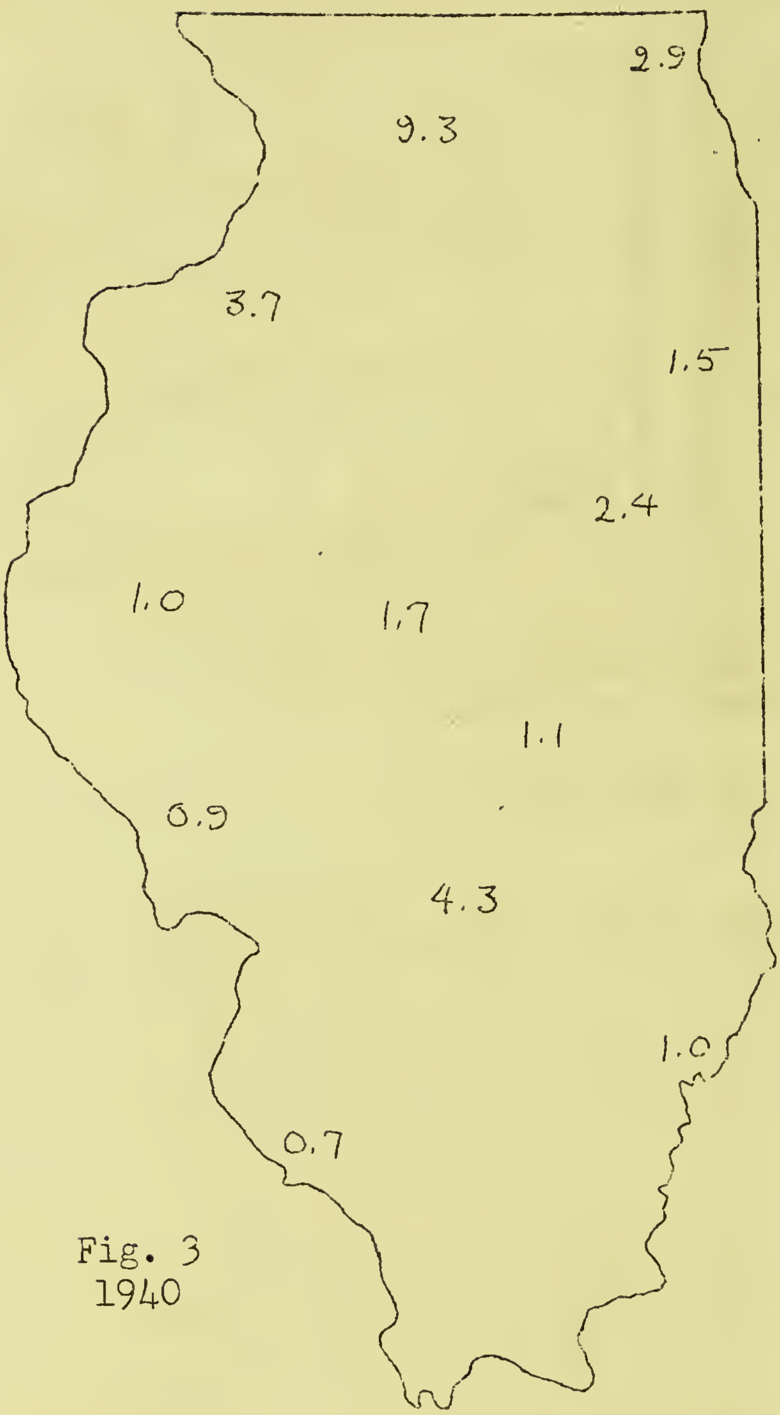

Fig. 3
1940

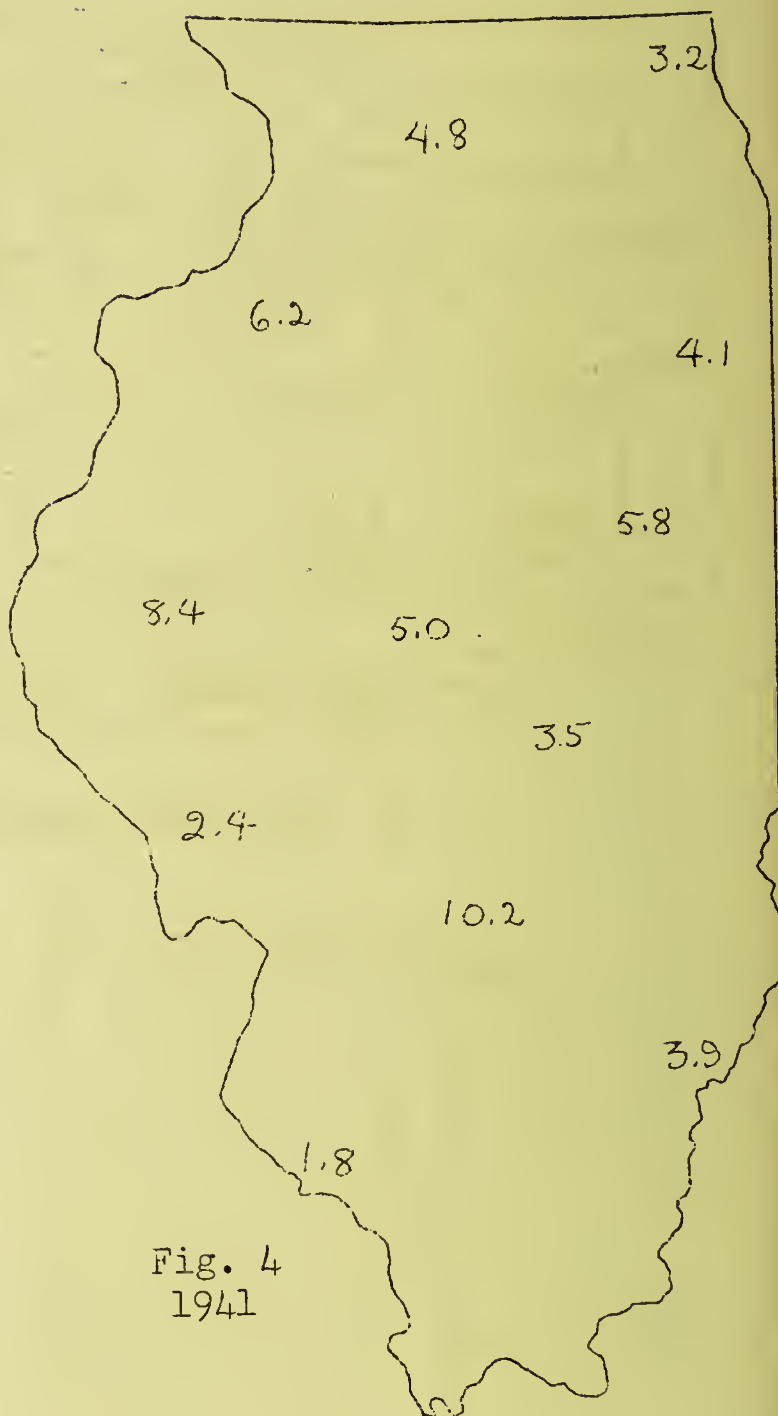

Fig. 4
1941

Figures 3 and 4. Percentage of damaged corn in the shelled samples. Average of all entries at each of the testing fields in Illinois Crop Performance Tests, 1940 (Fig. 3) and 1941 (Fig.4).

The purpose of reviewing this information here is to call attention to the fact that evidence from the reports of the licensed inspections of June corn receipts at Illinois terminals as to the condition of the crop of the previous year agrees with the results of actual measurements of losses in testing fields throughout the State.

A direct comparison of the figures for Illinois terminals as given on the maps (Figure 1, A and B) indicates that on the average corn was

decidedly poorer in quality in 1941 than in 1940.[2] The difference is actually somewhat greater than appears from these figures. Chicago draws corn from a wide area outside Illinois and should not be considered in this connection. Kankakee (1940), and Champaign (1941) handle much smaller volumes than Peoria and Decatur. The actual percentage of all cars showing over 5% total damage at all terminals within Illinois, except Chicago, was approximately 24 in 1941 and 14 in 1940, a ratio almost too close to that between the figures for average kernel damage on the test plots, given above.
(UNIVERSITY OF ILLINOIS).

MISCELLANEOUS NOTES: MOSTLY NORTH DAKOTA

Roderick Sprague

On Diseases of Cereals and Grasses. Root browning (*Pythium arrhenomanes*) on various cereals and grasses appeared some days later than usual, but developed rapidly in June and even into July. Injury to wheat and barley was severe in west-central North Dakota. The injury to grass seedlings was again heavy, but the cool weather permitted better recovery than in recent years. There was less injury in millets (including proso) in late seeded (June) stands, but pre-emergence blight (*P. debaryanum*, *P. arrhenomanes*, etc.) greatly reduced earlier seedings. *P. arrhenomanes* was isolated from as far west as Pullman, Washington, and even occurred scatteringly in grasses growing in peat bog areas in northern Minnesota. *Helminthosporium sativum* was not so serious in wheat as in dry years, but was prevalent in early seeded barley and in some grasses, including *Stipa viridula*.

Root necrosis (mostly *Pythium debaryanum*) was unusually severe in oats causing from 5 to 10% calculated average reduction in yield in the area. Red leaf in oats was very common and was favored by the cool weather, aphids, and root necrosis.

The honey dew stage of *Claviceps purpurea* was prevalent in grasses at Mandan, particularly in *Poa ampla*, *P. canbyi*, and *P. palustris*. The yellow bacterial slime disease of *Sporobolus* was again present at Mandan, and black chaff (*Bacterium translucens* var. *undulosum*) was unusually severe on wheat in western North Dakota.

Leaf rust (*Puccinia rubigo-vera*) is widespread and moderately severe on wheat and grasses in the area, but stem rust (*P. graminis*) is not yet serious except on a few susceptible wheats and certain species of *Agropyron*, including *A. michnoi* at Mandan.

Loose smut (*Ustilago nuda*) of barley (Hannchen variety) averaged 5 to 10% in the plots on the Mandan Field Station and was relatively abundant throughout North Dakota.

Ustilago bullata Berk. (determined by George W. Fischer) is be-

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[2] Copper, R. R., G. H. Dungan, A. L. Lang, J. H. Bigger, Benjamin Koehler, and Oren Bolin; Illinois corn performance tests, 1940. Illinois Agr. Exp. Stat. Bul. 474, pp. 181-182.

ginning to appear in bromes at Mandan, and occurs scatteringly in western South Dakota and Wyoming on Bromus japonicus. Incidentally, Bromus tectorum, rare until now in our area, is this year widely distributed along our main highways and laterals.

On Diseases of Vegetable Crops and Ornamentals. In the local gardens, great difficulty was experienced with pre-emergence rotting of beans (Phaseolus vulgaris, P. lunatus) and cucurbits. Downy mildew (Bremia lactucae) was abundant on the new vegetable celtuce (Lactuca) but not serious after the early season. A great deal of local difficulty was experienced on the Mandan Field Station with a rot of snapdragons, asters, and chrysanthemums. The plants not only damped-off, but later died in the blossoming stage and the roots were rotted away to black stubs. Pythium debaryanum or a related species appears to have been the cause. The condition was particularly severe where snapdragons had been planted out-of-doors in places where hardy chrysanthemums had been grown.
(DIVISION OF CEREAL CROPS AND DISEASES).

CEREAL DISEASES IN NORTH CENTRAL STATES

Henry O. Putnam

We have had a heavy epidemic of scab [Gibberella zeae] in wheat and barley in southwestern Minnesota and eastern South Dakota. Our milling and baking test plots at Morris, Minnesota were sowed in March and they are so badly scabbed that I am afraid there may not be enough crop for our tests. The new North Dakota selections, 2829 and 2822, in our Morris plots seem to have heavier scab than Thatcher or Regent. 2822 carried the heaviest amount. The scab damage also extends into the southern edge of North Dakota.

Dr. J. J. Christensen has plated several barley samples which show almost entirely scab infection.

Scab seems to be more severe on Thatcher, Renown and Regent than on Pilot and Rival. It would seem that their earliness made them more vulnerable to scab this year.

Leaf rust [Puccinia anomala; P. rubigo-vera tritici] is prevalent in the barley and in susceptible wheat varieties in the above area.

Crown rust [P. anomala] has decreased the oat yield in this area but it is much less severe than last year.

Flax rust [Melampsora lini] is severe in many fields from Milbank, South Dakota north into the Red River Valley and west into North Dakota. It is especially severe on Bison but it can easily be found in fields of Redwing and Biwing. Viking seems to be free of it. This will undoubtedly create a demand for rust resistant varieties.

Harvesting of barley and rye has progressed into central North Dakota this week.
(NORTHWEST CROP IMPROVEMENT ASSOCIATION).

SOME FRUIT DISEASES IN PENNSYLVANIA

George L. Zundel

Cherry Viruses: Some of the cherry leaf viruses in this State reported earlier (PDR 26: 261. June 15) have been identified. Specimens of yellow leaves collected in Adams County and sent to Dr. Hildebrand at Cornell were identified by him as cherry yellows. Some of the cherry growers have informed me that this condition has been gradually spreading in the orchards so that in some sections as many as 10 to 15% of the trees have yellow leaves.

Another condition Dr. Hildebrand identified as necrotic ring spot. From recent trips to Adams County I find that this disease is more prevalent in the orchard than I had expected.

Mr. O. S. Cannon has found tatter-leaf of sweet cherry in Erie County and I have found it in Lawrence and Blair Counties. In Blair County I saw one tree with about 100% of the leaves destroyed and they certainly looked tattered. (July 23)

Powdery Mildew on Cherry: Yesterday Dr. Thurston and I drove to Adams County. We found a young unsprayed Montmorency cherry orchard in which probably no less than 99% of the terminal leaves were literally covered with powdery mildew [*Podosphaera oryacanthae*]. As we went over the county we noted that this fungus was very common where no spraying had been done. I have never seen powdery mildew of cherry so severe. (July 24)

Cylindrosporium Leaf Spot on Red Raspberry: Last week, in Mercer County, while looking over raspberries I found an unusual disease on new red hybrids. The leaves of Newburg and Marcy were heavily covered with a leaf spot that I took for anthracnose, but the spot did not seem characteristic. When specimens were examined by Dr. Overholts, we found that the fungus on the leaf spot was *Cylindrosporium rubi* Ell. & Morgan. In 14 years this is the first time I have seen this fungus causing widespread damage to raspberry leaves, and according to our records it is the first report from Pennsylvania. I expect that within a short time there will be heavy defoliation. The stems of the variety Marcy were very heavily infected with anthracnose [*Elsinoë veneta*]. An adjacent patch of the Cuthbert red raspberries did not show either disease. (July 22)

Fire Blight: Fire blight [*Erwinia amylovora*] has been rather severe in our sprayed apple section. It has been more destructive owing to the fact that the blossom blight stage was very prevalent.

I do not remember ever having seen any figures giving losses caused by fire blight, consequently, I have tried to figure out some way of expressing the loss in percentage. For that reason, I made counts in 2 counties, confining the counts to the blighted blossom clusters. The trees were not picked out especially but taken at random and in all cases except one 100 blossom clusters were counted, taking all on any given limb.

Partial Survey of Blossom Blight on Apple Trees in Central Pennsylvania 1942 - G. L. Zundel

County	Orchardist	Variety	Per Cent Blighted Blossom Clusters
Cumberland	1[a]	York	99
	1	"	80
	1	"	84
	2	Jonathan	80
	3	York	53
Franklin	4	Jonathan	40
	4	"	17
	4	"	57
	5	"	77
	5	"	34
	6	York	97
	6	"	99
	6	Rome	75
	6	"	38
	6	Stayman	73
	7	MacIntosh	50
	7	Gravenstein	50
	8	Jonathan	38
	8	"	46
	8	Rome (young trees)	72
Huntingdon	9	Maiden Blush	95
	9	" "	90
	9	Jonathan	96
	9	"	75

a/ 200 apples counted

The table shows that on the trees examined from 17 to 99% of the blossoms are blighted. No counts were made of any twig blight.

Other observations were made on a number of orchards sprayed in full bloom with the copper spray, and in almost every case where that spray was applied at the proper time, blossom blight was controlled nearly completely. One planting of Bartlett pears in Blair County was almost cleaned out a few years ago, but I started the orchardist with full bloom spray and even in the blight years such as this, the pears have not blighted. Although I did not find any blight in his orchard where copper sprays were applied, some early summer varieties not receiving the copper spray had nearly 95% of the blossom clusters blighted. (July 22)

Brown Rot on Wild Plum: Yesterday I passed through a rather large ornamental planting of *Prunus besseyi* Bailey full of mature fruit, with from 85 to 95% of the fruit mummied or badly attacked with brown rot, *Sclerotinia americana* [*Monilinia fructicola*]. (July 29) (PENNSYLVANIA STATE COLLEGE).

A LETHAL VIRUS DISEASE OF CANTALOUP OCCURRING IN THE IMPERIAL VALLEY

John T. Middleton and Thomas W. Whitaker

A lethal virus disease of cantaloups, caused by a strain of the cucumber mosaic virus, was first observed this season in the Imperial Valley of California. The symptoms of this disease, which are quite distinct from those of the common cantaloup mosaic prevalent in the region for many years, consist of a sudden dying of the older leaves and subsequent yellowing of the runners; the runners usually collapse 2 to 4 days later. Longitudinally oriented necrotic streaks are often present on the stems of the runners. No mosaic pattern is visible in the older leaves and is only vaguely discernible in the young leaves. In old infected leaves the small veins become necrotic, with little or no necrosis of the surrounding mesophyll tissues. On the other hand, plants affected with the common cantaloup mosaic virus exhibit a very conspicuous mosaic pattern in leaves, do not have necrotic streaks on the stems and only rarely die, and then very gradually.

The disease was reproduced in the greenhouse by inoculating cantaloups with juice taken from yellowed runners from dying plants. Plants inoculated through the cotyledons produced one true leaf and then collapsed. Squash and cucumber were successfully inoculated; the symptoms produced in these plants were similar to those produced by the common cucumber mosaic virus.

The disease was most damaging in 2 early plantings comprising 250 acres. Both of these fields were adjacent to a planting of squash which was subsequently observed to be badly diseased with a strain of the cucumber mosaic virus. Approximately 75% of this acreage was lost; a perceptibly higher percentage adjacent to the squash planting and a smaller percentage away from it. Little trouble was experienced in other cantaloup plantings in the Valley, although there were isolated occurrences of the disease in some of the later plantings.

The cantaloup mosaic virus is seed-borne. Because of the lethal effect of this strain of cucumber virus in cantaloup, the possibility of perpetuation through seed transmission seems remote.

(COLLEGE OF AGRICULTURE, UNIVERSITY OF CALIFORNIA; AND DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES, U. S. BUREAU OF PLANT INDUSTRY).

NOTES ON SOME DISEASES OF ORNAMENTALS

Freeman Weiss

Colletotrichum trichellum Fr.) Duke (C. hedericola Laub.) on stems of Hedera helix. This common leaf-spotting organism is only infrequently reported as causing stem lesions. Infection of stems is not mentioned by Duke (Trans. Brit. Myc. Soc. 13:173. 1928) but is said to occur rarely on petioles and branches by Schwarze (New Jersey Agric. Exp. Sta. Bull. 313, p. 106). Several times within recent years specimens of English

ivy have been received for diagnosis that were characterized by extensive stem necrosis, and in some instances the dying out of plants in patches of considerable size was mentioned. These reports always referred to ground beds of ivy, and usually were made in midsummer; therefore winter injury was not suspected. However, examination of specimens at the stage ordinarily received proved unsatisfactory because of the presence of a variety of apparently saprophytic organisms. On June 22, 1942 specimens of this sort were submitted under the descriptive name "stem collapse disease" by Horace Wester of the Office of National Capital Parks. They had been collected in a shady ground bed, in which the plants in large patches appeared to be dying. Some of the leaves bore typical spots caused by Phyllosticta concentrica Sacc., and C. trichellum was sporulating on necrotic areas of others, but a more significant pathological factor was the presence of necrotic lesions on petioles and stems. Some were only a few mm. long but the stem was effectively girdled. In the absence of facilities for tissue isolations, the cause of these lesions could only be inferred from the consistency with which C. trichellum developed on them when specimens were incubated in a moist chamber or when bits of tissue were cut out and kept in water for several days. No other significant organisms were observed. It appears that C. trichellum may cause a serious stem disease as well as a leaf spot of Hedera, for which the name anthracnose is appropriate. The outbreak of the disease in this instance may have been influenced by a protracted period of humid weather, since light precipitation was recorded on 12 days of the 3 weeks preceding the collection and 15 days were cloudy.

Stem canker and foot rot of Vinca minor. In May 1942 specimens of common periwinkle were received which exhibited two apparently distinct diseases. One was a necrosis of limited extent (canker) on shoots of recent growth; the other was a foot rot involving the older stem bases and upper roots, and was characterized usually by the rupture or sloughing off of the cortex. Specimens of the same aspect were obtained from 3 sites in the city of Washington, and from Virginia and Maryland suburbs. The portions of shoots distal to the cankers, or whole plants when attacked by foot rot, were dying. The first specimens received bore Rhizoctonia solani on both types of lesions, which was possibly of no pathological significance although the occurrence of this fungus in connection with diseased Vinca has been reported to the Survey several times. Specimens subsequently obtained bore a pycnidial fungus on the stem bases which corresponds to the alpha conidial stage of Phomopsis lirella Grove but no beta type conidia were observed. The same organism also developed, after incubation, on the cankers on stems. This would indicate that it is definitely parasitic on this host, a fact not mentioned in Grove's original description nor in mycological records of Diaporthe eumorpha (Dur. & Mont.) Maire, its ascigerous stage. However Martin (P.D.R. 13: 60. 1929) attributed a wilt or scorch of Vinca to P. lirella. Phyllosticta minor Ell. & Ev. developed abundantly as a saprophyte on the foliage but not the stems of moribund plants.

Top blight of rhododendron. *Phytophthora cactorum* caused a severe top blight and in some instances the death of hybrid rhododendrons in Washington, D. C. that were transplanted this year from New Jersey. This is the farthest south that this disease has been recorded in the United States.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

REPORTS ON POTATO LATE BLIGHT

MASSACHUSETTS: Late blight [*Phytophthora infestans*] appeared unusually early in all parts of the State this year. It was observed first on June 26 in Hampshire County. Since then, it has developed slowly in the Connecticut Valley. Field visits in Bristol County on July 2 revealed light scattered infections in most sprayed fields and light to severe infections in unsprayed Irish Cobblers. One field of Cobblers on that date was brown with three-fourths of the plants dead. During the examination of 16 fields in Hampshire and Franklin Counties on July 21, late blight was observed in all but 2. The only really threatening cases were in either unsprayed fields or fields that had been dusted throughout or sprayed only 2 or 3 times. (O. C. Boyd, Massachusetts State College. July 24).

NEW YORK: (County reports from the Weekly News Letter for the dates given).

Nassau Co. -- On July 11 the weather was cool and wet for well over 24 hours, favoring the rapid spread of late blight. Fields that were a healthy green on the 10th were brown with the disease on the 13th. Some growers have put on 2 heavy applications of copper on the same field during this week. Fields that had early fungicide applications appear in good green condition. (R. W. Roth, July 20).

Late blight has severely affected the middle-season and late potatoes on the North Fork. There are few fields without at least one badly blighted area, and some have been attacked so severely that only the stems remain. Many growers have applied as many as 7 copper sprays and still have blight. Complaints are especially numerous against cuprocide dusts and sprays, but there appear to be as many good fields treated with cuprocide as with bordeaux. The indications at present seem to point to poor timing of applications. (J. E. Dewey, July 27).

Suffolk Co. -- The rain of the 12th was very favorable for late blight which spread very rapidly over the weekend. Hot weather this week has done much to hold down further infection. (J. E. Dewey, July 20).

Oswego Co. -- Late blight is present in the county. (L. E. Curtis, July 20).

Wayne Co. -- Late blight has been found in a number of potato fields this week. (W. D. Tyler, July 27).

Orleans Co. -- Blight (Phytophthora) is just showing up, and some early (Alternaria) blight is present. (A. G. West, July 27).

Allegany Co. -- Blight is evident in some fields and has done considerable damage in unsprayed fields. (A. E. Durfee, July 27).

Erie Co. -- Potato late blight was found on July 22 in 2 unsprayed fields. There is some evidence that it exists in other fields and it is probably scattered throughout the southern part of Erie County. (C. F. Crowe, July 27).

Ulster Co. -- Late blight is reported on potatoes throughout the county. (C. G. Small, July 27).

VIRGINIA: Late blight was observed in Wythe County during the week of July 20. Both leaf and tuber infections were found. (S. B. Fenne, Extension Plant Pathologist).

MINNESOTA: Late blight was first noted in Hennepin County by R. C. Rose, extension plant pathologist, about 2 weeks ago. This is more than a month earlier than last year when damage was extensive, especially in eastern and northeastern Minnesota. The disease has now been reported from several sections in southern Minnesota, as far north as Aitkin and west to Kandiyohi County. In Wisconsin where the disease struck earlier many fields are already reported completely destroyed. (News Bureau, University Farm, St. Paul. July 28).

IOWA: Late blight was collected on July 10 near Spirit Lake. The vines in an 8-acre field were very generally diseased. Apparently the disease was first present in June according to growers' observations. A survey on the 11th in 4 counties showed that late blight was prevalent in several fields. There was some late blight in this State in the fall of 1941 and much of the seed purchased in the north showed some diseased tubers. This fact coupled with the cool moist weather from May 20 until now doubtless explains this unusually early presence of the disease this season. Weather permitting, the stage is set for a real epiphytotic. (I. E. Melhus, July 16).

RECENT OBSERVATIONS ON PLANT DISEASES IN MASSACHUSETTS

O. C. Boyd

Asparagus. Rust [Puccinia asparagi] was first observed in the Connecticut Valley July 11 on one of the Washington varieties, and 2 days later on the Paradise variety. In the latter case, moderate to severe infection had occurred earlier in the season in the base of the stems just at and below the ground line, and then resumed activity more or less recently. This same variety on one farm showed considerable loss also as yellow, dying plants due to Fusarium stem rot.

Beans: Halo blight [Phytomonas medicaginis phaseolicola] is giving way now to P. phaseoli blight generally. No severe infections have been observed yet of the latter. A total loss of a field of Black Valentine snap beans was observed in Plymouth County on July 17 from anthracnose [Colletotrichum lindemuthianum]. Later plantings entering bloom showed

considerable stem, leaf and branch infection. Unplanted seed of the same batch revealed about 5% visibly infected seed. On the same farm, there were 2 fields of staked Kentucky Wonder planted in sites where other kinds of crops grew last year. One field, with stakes that were used in a rusted planting of Kentucky Wonder last year, was very heavily rusted, while the other one staked with new poles showed only a trace of rust [Uromyces phaseoli]. Most of the rust pustules, by the way, were whitish, and the spores appeared colorless under the microscope. A few younger pustules on the same leaf were normally reddish-brown. Watery soft rot (Sclerotinia sclerotiorum) is unusually prevalent now in thick plantings in home gardens, both on the branches and the pods.

Cabbage: Yellows [Fusarium conglutinans] is much less pronounced this year in Essex County than at the corresponding date last year.

Carrot: The Cercospora leaf-spot disease of carrots was causing rather severe defoliation in a field in Franklin County along the Connecticut River, on July 18, and was unusually severe in Essex County on July 23 for that time of year. This is somewhat early in the season for the disease. It usually is severe only in the fall crop.

Celery: On July 14, a very severe infection of the small-spotted late blight [Septoria apii-graveolentis] was observed on Summer Pascal in Worcester County, with 2 other varieties growing alongside almost entirely free of the disease. No seed or seed-bed treatment had been given although the field had been dusted a time or two since setting out.

Celtuce: This new vegetable is quite subject to watery soft rot, as leaf infections before stalking and stalk infections later on, according to its behavior in my own garden.

Cucumber: Downy mildew [Pseudoperonospora cubensis] had not appeared in Bristol County on July 1, nor in Hampden County on July 7, in Worcester County on July 14, nor in Plymouth County on July 17. Moreover, a survey of 9 pickle fields in the Connecticut Valley yesterday revealed none whatever. However, bacterial wilt [Erwinia tracheiphila], scab [Cladosporium cucumerinum] and angular leaf spot [Phytomonas lachrymans] were observed in each of the areas on those dates. Anthracnose [Colletotrichum lagenarium]was observed as early as June 23 in a cucumber field in Franklin County where the same crop affected with anthracnose was grown last year. One field out of nine that I examined yesterday showed anthracnose, and it was located where the same crop was raised there in 1941. Scab was causing severe fruit spotting in one side of a field where cucumbers were grown last year, and very light spotting in the remainder of the field where a crop other than a cucurbit was planted in 1941. By this time last year, mosaic [virus] was moderate to severe in many cucumber fields in the Connecticut Valley. It was observed in only one field yesterday, and it was just getting started there. Neither the striped cucumber beetle nor bacterial wilt has been

so prevalent this year as in 1941.

Lettuce: Bottom rot [Corticium solani] was more severe generally this year on the early crop than in most past seasons, but was not pronounced on the later plantings in July. One light case of downy mildew [Bremia lactucae] was observed in Seekonk, Bristol County on July 2.

Onion: In spite of the unusually cool, damp weather in June and July, downy mildew [Peronospora destructor] has not been observed this year. The non-parastic "blast" varies from light to severe on both seed and set onions. Early in July, more than the usual amount of bulb decay in set onions was observed in the Valley crop, starting apparently as a Fusarium basal-plate rot and ending with a bacterial soft rot. The latter type of decay resulted quite commonly following the cutting out of seed stalks, owing perhaps to the unusual amount of wet weather.

Pea: A severe infection of one of the Fusarium wilts was observed in Hampden County on June 25 on light sandy loam soil that had not been planted to peas for 5 or 6 years. In Worcester County on July 14, a field of Telephone peas on rather heavy soil showed a heavy loss from root rot, probably the Aphanomyces rot. The damage in the upper or higher portion of the field was greater by far than that in the lower portion of the field. Judging from reports, root rots generally were very common and damaging this year to pea crops in the State.

Potato (See also under potato late blight): Black leg [Erwinia phytophthora] has been pronounced in Cobblers and Sebago, about normal in other varieties. Leafroll [virus] has been less pronounced this year than it was last year, particularly in Chippewa. Ring rot [Corynebacterium sepedonicum] has not been observed yet in the field, although one infected seed lot (certified) was encountered in the spring when gathering samples for a seed-source test.

Spinach: Downy mildew [Peronospora effusa] was observed in a field in Seekonk, Bristol County, on July 1. The grower stated it had been present throughout the season on all of his plantings.

Tomato: Early blight [Alternaria solani] got started generally around the middle of the month. In Worcester County on July 14, a field of staked tomatoes showed moderate infection half way up the plant. Unsprayed fields in Plymouth County on July 17 showed light to moderate infections on the lower leaves of staked and trellised fields.

Squash: Scab [Cladosporium cucumerinum] has damaged the summer squash crop in the State earlier and more severely this year than in most past seasons. A total loss of a commercial field of transplanted summer squash in Hampden County was observed on June 26, and the grower was then ready to plow up the field. The crop had just reached first harvest, and every leaf and every fruit down to those only 1 1/2 to 2 inches in length

were spotted. The grower had observed crop rotation and use of clean seed bed soil but not seed treatment.

Tobacco: Downy mildew [Peronospora tabacina] is still active on the lower leaves of Havana tobacco, the latest it has ever been observed to remain active in this State, and is higher up on the plants than usual. (MASSACHUSETTS STATE COLLEGE).

BRIEF NOTES ON PLANT DISEASES

WHEAT NEMATODE SPREADING IN SOUTH CAROLINA: The wheat nematode [Anguina tritici] has very definitely become more widespread in South Carolina in the past few years. This year, specimens have been received from the following counties: Oconee, Anderson, Spartanburg, Cherokee, and Lancaster. The Assistant County Agent in Saluda County recently reported to Mr. W. C. Nettles, Extension Plant Pathologist and Entomologist, that the disease was also rather prevalent in that county. Mr. Nettles reports that one mill owner in Oconee County has become so alarmed about the disease that he has arranged to save a sample from every lot of wheat seed milled. Every sample showing the nematodes will be reported to the County Agent who will write the owner a letter that has been prepared in cooperation with Mr. Nettles. (Geo. M. Armstrong, Clemson Agricultural College, July 20).

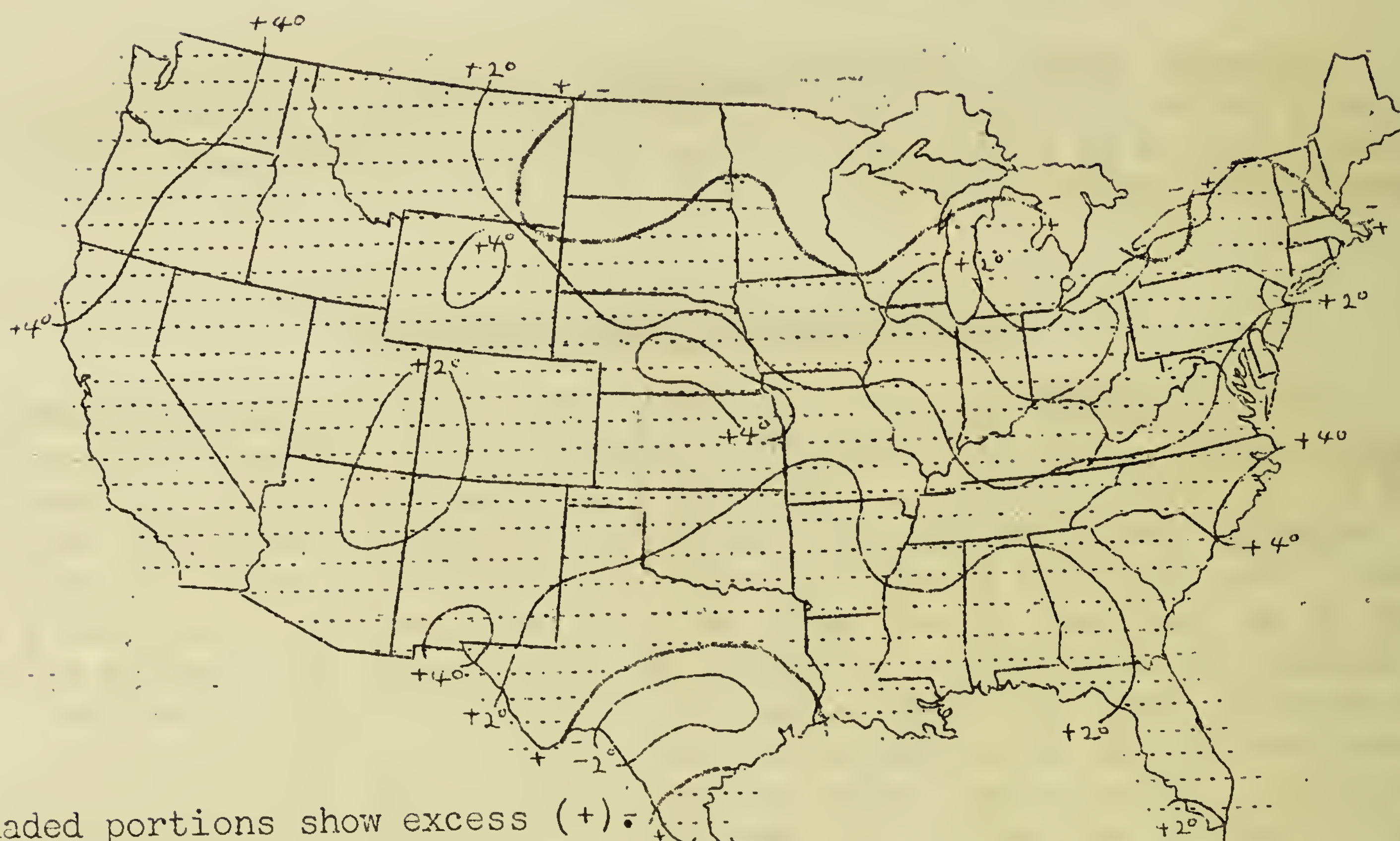
TWO DISEASES ON POPPY IN OREGON: Two diseases were observed on cultivated poppy, Papaver somniferum, in Linn county, Oregon, during the month of July, 1942.

From affected areas on the green pods I secured the bacterial blight organism, Bacterium papavericola, and from a basal stem rot I isolated pure cultures of Sclerotinia sclerotiorum.

The bacterial blight is present in varying amounts annually. (George R. Hoerner, Agent, Division of Drug and Related Plants, Bureau of Plant Industry in Cooperation with Oregon State Agricultural College, July 31).

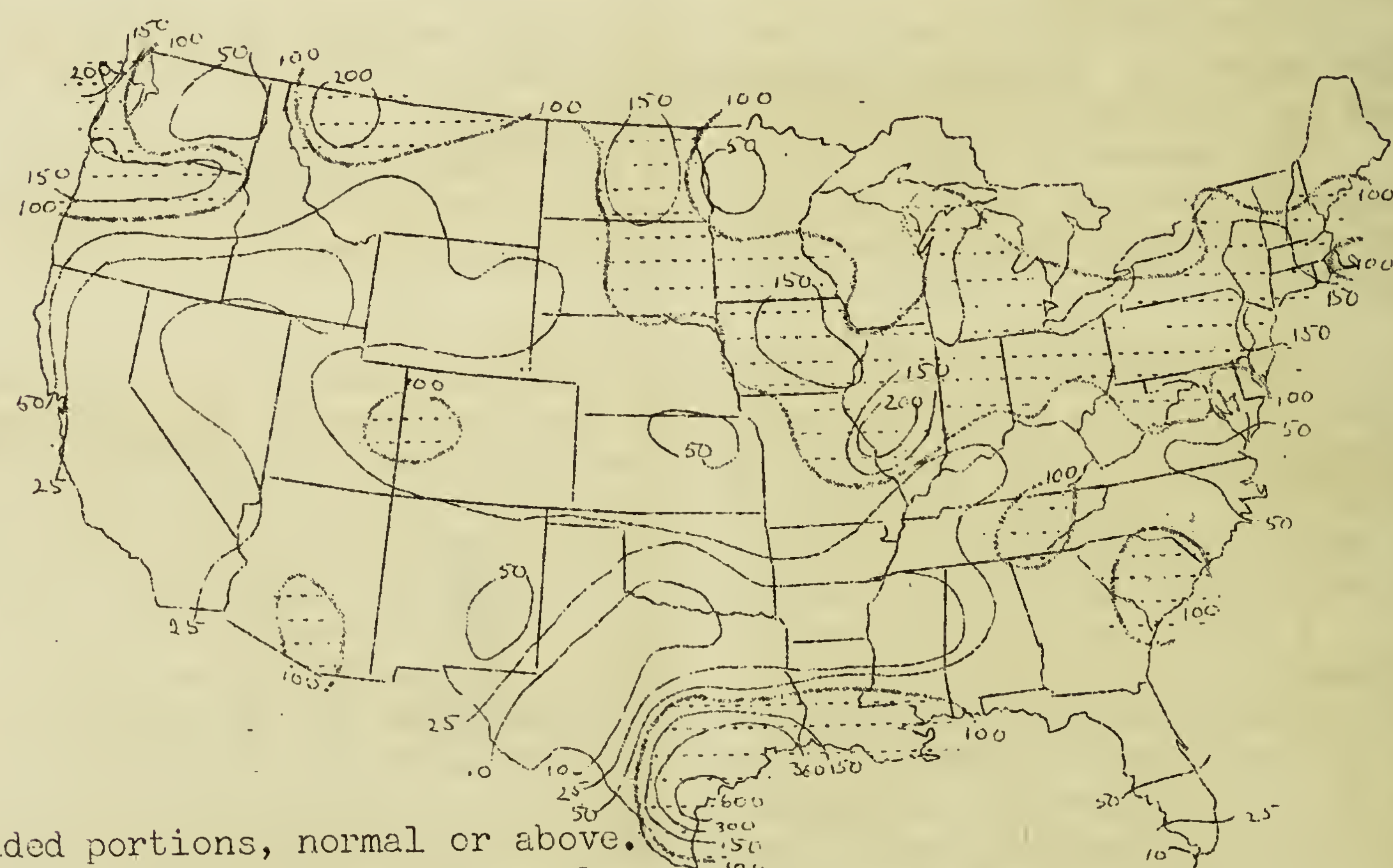
BEAN ANTHRACNOSE VERY SEVERE IN VIRGINIA: During the past season we have observed a tremendous amount of bean anthracnose [Colletotrichum lindemuthianum] in the Victory Gardens of Virginia. In many cases we have traced the source of seed to our State dealers who have informed us that the seed in question was obtained from the high arid regions of the northwestern states and, therefore, should be free of the anthracnose fungus.

Weather conditions have been particularly favorable for the development of bean anthracnose this season. The prolonged wet period in June resulted in many bean plants being killed outright by anthracnose, and the majority of gardens in some areas developed a heavy leaf and pod infection. Growers are beginning to lose faith in our recommendation of planting western-grown seed, since they are under the impression that they have been planting seed grown in that area, yet have had heavy anthracnose infection. (S. B. Fenne, Extension Plant Pathologist, July 27).



Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 1. -- Departure of Mean Temperature from the Normal for July 1942



Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Fig. 2, -- Percentage of Normal Precipitation for July 1942

JULY WEATHER

(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin for week ending August 4, 1942).

The month of July 1942 was characterized by unusually widespread, moderately above normal, temperatures, and uneven geographic distribution of rainfall. Figure 1 shows that much the greater portion of the country had monthly mean temperatures ranging from about 1° to 3° or 4° above normal. The more northern States east of the Rocky Mountains had approximately normal warmth, while in most of southern Texas the average temperature was 2° or 3° below normal. The largest plus departures, 4° or 5°, appear in the east-central Great Plains and the Pacific Northwest.

Figure 2 shows that rainfall was mostly above normal over the northern half of the country east of the Rockies and in parts of the south Atlantic and west Gulf areas. On the other hand, a belt extending from the extreme lower Ohio Valley, western Tennessee, and northern Alabama westward had a decidedly dry month.

There were some marked contrasts, however, in nearby localities. Cairo, Ill., reported only 20 percent of normal rainfall, while nearby St. Louis, Mo., had the wettest July since 1875. Del Rio, Tex., had 5 percent of normal and Brownsville 32 percent, while San Antonio and Corpus Christi, nearby, respectively, each had the wettest July of record. Abilene, Tex., and Vicksburg, Miss., had the second driest of record. There were also some marked contrasts in the far Northwest, such as Kalispell, Mont., with 247 percent and Spokane, Wash., 49 percent of normal; Walla Walla, Wash., 213 percent and Yakima, Wash., 25 percent of normal.

INFORMATION REQUESTED

Late blight of potatoes made its appearance unusually early this season in several States and it has been found in areas where it is seldom present. It is reported to be unusually severe in some sections where the usual protective sprayings have been applied and a severe epiphytotic is feared. M. F. Barrus writes from New York, "I am expecting that this will be one of our very bad blight years, with a possibility of a large loss from tuber rot, as well as from early blighting of the vines." (August 3, letter to R. J. Haskell).

The Reporter would like to feature late blight in an early issue and requests collaborators in potato growing states for reports on the present status in their respective territories. Those received by August 19 will be used in the September 1 issue.

Statements of the prevalence of barley scab and wheat scab in 1942 are also requested.

Soybean diseases are a subject of special interest at this time and requests are frequently made among pathologists as to their prevalence and identity. What is the situation in your area? -- H. A. E.

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Volume XXVI September 1, 1942 Number 16

IN THIS ISSUE

CHECK LIST REVISION

Freeman Weiss

SCHAEFFERIA (BIGNONIACEAE)

SCHAEFFERIA FRUTESCENS Jacq., FLORIDA-BOXWOOD. Evergreen shrub or small tree of S. Fla. and West Indies.
Microthyrium urbani Bres., black leaf spot. P. R.

SCHINUS (ANACARDIACEAE)

SCHINUS MOLLE L., CALIFORNIA PEPPER-TREE. Evergreen tree of tropical America, grown for ornament chiefly in Ariz. and Calif. A few records on S. TEREBINTHIFOLIA Raddi., BRAZIL PEPPER-TREE, grown for ornament in the far South, are included.
Armillaria mellea Vahl ex Fr., root rot. Calif.
Botryosphaeria ribis var. chromogena Shear et al., on branches. T. H.
Cuscuta subinclusa Dur. & Hilg., dodder. Calif.
Fomes applanatus (Pers. ex Fr.) Gill., heart rot. Calif.
Heterodera marioni (Cornu) Goodey, root knot. Texas.
Ganoderma polychromum (Copeland) Murr., trunk rot. Calif.
Meliola malacotricha Speg., black mildew. P. R.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Texas.
Polyporus dryophilus Berk., heart rot. Calif.
P. farlowii Lloyd (Inonotus schini J. G. Brown), heart rot. Ariz., Calif.
P. sulphureus Bull. ex Fr., heart rot. Calif.
P. versicolor L. ex Fr., wound rot. Calif.
Schizophyllum commune Fr., wound rot. Calif.
Stereum hirsutum Willd. ex Fr., wood rot. Calif.
Trametes hispida Bagl., wood rot. Calif.
Verticillium sp., wilt. Calif.

SCIADOPITYS (PINACEAE - TAXODIINEAE)

SCIADOPITYS VERTICILLATA (Thunb.) Sieb. & Zucc., UMBRELLA-PINE. Ornamental evergreen tree of Japan, cult. Zone V.
Phyllosticta sp., leaf spot. R. I.
Rhizoctonia solani Kühn, damping off, root rot. Conn.
Sphaeropsis sp. (? S. ellisii Sacc.), twig blight. N. J.

SECURIDACA (POLYGALACEAE)

SECURIDACA spp. Erect or trailing shrubs of tropical America, sometimes grown for ornament.
Meliola bicornis Wint., black mildew. P. R.
Morenoella whetzelii Toro, black mildew. P. R.
Phyllachora securidacae P. Henn., black leaf spot. P. R.

SEQUOIA (PINACEAE - TAXODIINEAE)

SEQUOIA GIGANTEA (Lindl.) Decne, GIANT SEQUOIA. Evergreen tree of restricted range in central Calif., occasionally grown for ornament in the South. (The names Sequoia washingtoniana (Winsl.) Sudw. and Sequoiadendron giganteum (Lindl.) Buchholz also have authoritative support. All records in Calif. unless otherwise indicated.)

Acanthostigma sequoiae (Plowr.) Sacc., on needles.
Botrytis douglasii Tub. (? B. cinerea Pers.), seedling blight. Calif., Ohio, Pa.
Cercospora sequoiae Ell. & Ev., needle blight. Md., Pa.
Fomes annosus (Fr.) Cke., trunk rot.
Lenzites saepiaria Wulf. ex Fr., wood rot.
Pestalotia funerea Desm., needle blight. Texas.
Phomopsis juniperovora Hahn, twig blight.
P. occulta Trav., on dead twigs. Conidial stage of Diaporthe conorum (Desm.) Niessl
Wallrothiella consociata (Ell. & Hark.) Ell. & Ev., on needles.

SEQUOIA SEMPERVIRENS (Lamb.) Endl., REDWOOD. Evergreen trees, of great timber value, occurring only in the coastal zone of central California to southern Oregon, occasionally grown for ornament in the far South; the burls sometimes grown as house plants. (All records in Calif. unless otherwise indicated.)

Armillaria mellea Vahl ex Fr., root rot.
Botrytis douglasii Tub. (? B. cinerea Pers.), seedling blight.
Chloroscypha chloromela (Phill. & Hark.) Seaver., ? needle blight.
Clithris sequoiae Bonar, on twigs.
Cytospora pinastri Fr., on twigs.
Dermatea livida (Berk. & Br.) Phil., bark canker.
Fomes annosus (Fr.) Cke., trunk rot.
Ganoderma sequoiae Murrill, trunk rot.
Hexagonia carbonaria Berk. & Curt., wood rot.
Hymenochaete tabacina (Sow. ex Fr.) Lév., wood rot.
Leptostroma sequoiae Cke. & Harkn., on twigs.
Merulius hexagonoides Burt, wood rot.
Mycosphaerella sequoiae Bonar, needle blight.
Phomopsis juniperovora Hahn and P. occulta Trav., on twigs.
Polyporus spp., wood rot. P. amorphus Fr., P. sulphureus Bull. ex Fr., P. versicolor L. ex Fr.
Poria incrassata (Berk. & Curt.) Burt, dry rot of timber.
P. sequoiae Bonar, brown pocket heart rot.
Schizophyllum commune Fr., wood rot.
Stereum fasciatum Schw. and S. hirsutum Willd. ex Fr., wood rot.

SEQUOIA SEMPERVIRENS cont.
Trametes spp., wood rot. T. americana Overh., T. carbonaria Berk. & Curt. (T. sequoia Copeland), T. isabellina Fr.
Trunk galls (burls), cause unknown.

SERJANIA (SAPINDACEAE)

SERJANIA spp. Woody vines of tropical America, sometimes grown for ornament in the far South.

Cephaleuros virescens Kze., green scurf. P. R.
Meliola ambigua Pat. & Gaill., black mildew. Canal Zone, P. R.
M. serjaniae F. L. Stevens, also var. dentata F. L. Stevens. P. R.
Phyllachora sapindacearum F. L. Stevens, black leaf spot. Canal Zone.
P. serjaniicola Chardon. C. Z., P. R.
Puccinia arechavaletae Speg., rust (III). Texas, P. R.

SHEPHERDIA (ELAEAGNACEAE)

SHEPHERDIA ARGENTEA Nutt., SILVER BUFFALOBERRY, and S. CANADENSIS (L.) Nutt., RUSSET BUFFALOBERRY, shrubs or small trees of northern U. S. from New England to Texas and Wash., the former grown in hedges, also for ornament and edible fruit, Zone II.

Cucurbitaria spp. (C. occulta Cud. and C. shepherdiae Ell. & Ev.), on dead branches. Mont., N. Dak.
Cylindrosporium shepherdiae Sacc., leaf spot. Utah, Wis.
Fomes fraxinophilus (Pk.) Sacc., forma ellisianus (F. W. Anders.) Baxter, white heart rot. Northern Rocky Mt. States.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Puccinia caricis-shepherdiae Davis, rust (O, I). N. Y. to Colo., N. Mex., Wash. & Alaska. II and III on Carex spp.
P. coronata Cda. (? var. elaeagni Fraser & Ledingham), rust (O, I). On S. canadensis in S. Dak. to N. Mex., Wash. & Alaska; reports on S. argentea doubtful. II and III on cereals and grasses.
Septoria shepherdiae (Sacc.) Dearn., leaf spot. Alaska, Idaho, Mont., Wis.
Sphaerotheca castagnei Lév., powdery mildew. Mont., Wyo.
S. humuli DC. ex Burr. Colo., Mont., Alaska.
Valsa spp. (V. ambiens Pers. ex Fr. and V. lepargyreae Ell. & Ev.) on dead branches. N. Dak., Wash.

SIDEROXYLON (SAPOTACEAE)

SIDEROXYLON spp. (chiefly S. FOETIDISSIMUM Jacq., MASTIC). Small evergreen trees of tropical America including S. Fla., used in cabinet work.

Halstedia portoricensis F. L. Stevens, black leaf spot. Fla., P. R.

SIDEROXYLON spp. cont.

Meliola sideroxyli F. L. Stevens, black mildew. T. H.
Polyporus hirsutus Wulf. ex Fr., wood rot. Fla.
Trametes hydnoides Sw. ex Fr., wood rot. Fla.

SIMAROUBA (SIMAROUBACEAE)

SIMAROUBA spp. Small trees of S. Fla. and West Indies, sometimes grown for ornament.

Irenina glabroides F. L. Stevens, black mildew. P. R.

SIMMONDSIA (EUPHORBIACEAE)

SIMMONDSIA CHINENSIS (Link) Schneid. (S. californica Nutt.), CALIFORNIA JOJOBA. Evergreen shrub of Growth Regions 5 & 10, sometimes grown for forage.

Strumella simmondsiae Bonar, leaf & stem spot. Calif.

SMILAX (LILIACEAE)

SMILAX spp., GREENBRIER. Mostly thorny evergreen woody vines and forest weeds, occurring chiefly in the Southern States; some spp. furnish sarsaparilla, others decorative greens (for florists' smilax see Asparagus).

Aecidium smilacis Schw., rust (O, I). N. & S. Car. II & III unknown.
Anthostomella spp., on dead stems. A. ludoviciana Ell. & Langlois, La.; A. sepelibilis (Berk. & Curt.) Sacc., N. J. to Ga. & Tenn.
Ascochyta confusa Ell. & Ev., leaf spot. N. Y., Wis.
A. smilacis Ell. & Ev. N. Y.
(A. smilacis Ell. & Mart.): Stagonospora smilacis.
Botryosphaeria muriculata Ell. & Ev., on dead stems. Ala.
Cercospora smilacina Sacc. (C. petersii (Berk. & Curt.) Atk.), leaf spot. Conn. to Fla., Texas & Nebr.

C. smilacis Thüm. (C. mississippiensis Tracy & Earle), leaf spot. Mass. to Fla., Texas & Minn.
Colletotrichum smilacis Tehon, leaf spot. Ill.
Coniothyrium fuckelii Sacc., on stems. Miss., Mo.
Cylindrosporium smilacis Ell. & Ev., leaf spot. Ala.
Cytospora smilacis Cke., on exposed roots. Ga.
Dimerosporium nimbosum Ell. & Mart. (? Parodiopsis sp.), on stems. Fla., S. Car.
Diplodia smilacina Berk., on stems and leaves. La., Mass., Miss., Mo., R. I.

SMILAX spp. cont.

Diplodina smilacis Ell. & Ev., on stems. N. J. (Conidial stage of Sphaerella smilacina ?)

Dothiorella smilacina (Pk.) Petr. & Syd., leaf spot. Mass. to La., Texas and N. Dak. (Probably includes Sphaeropsis smilacina Pk., Phyllosticta smilacis Ell. & Ev. and also Ell. & Mart., P. smilacina (Pk.) Dearn. in part, Macrophoma smilacina (Pk.) Berl. & Vogl., and M. smilacis Bubak.)

Gloeodes pomigena (Schw.) Colby, on stems. Ind.

Glomerella cingulata (Ston.) Spauld. & Schrenk, on leaves. Md.

Gloniopsis ellisii Cash (Hysterium smilacis Schw.), on stems. R. I. to Fla. & La.

Haplosporella smilacis (Ell. & Ev.) Petr. & Syd., on stems. N. Y. (Sphaeropsis smilacis Ell. & Ev. and S. latispora Dearn.; possibly conidial stage of Physalospora obtusa).

Helicobasidium purpureum (Tul.) Pat., root rot. Texas.

Heterosporium asperatum Massee, on leaves.

Hypodermopsis smilacis (Schw.) Cash (Hypoderma smilacis (Schw.) Rehm), on stems. N. Y. to N. Car. & La.

Leptostroma smilacis Cke., on stems. N. Y., S. Car.

Leptothyrium smilacis Dearn., on stems. N. Y.

(Macrophoma smilacis Bub. and M. smilacina (Pk.) Berl. & Vogl.): Dothiorella smilacina.

Meliola smilacis F. L. Stevens, black mildew. P. R.

Mycosphaerella smilacicola (Cke.) Overh., leaf spot. Ga., S. Car. (Sphaerella smilacina Ell. & Ev. is recorded on stems in N. J.)

Myiocopron smilacis (De Not.) Sacc., on stems. Mass. to Ga. & Texas.

Mystrosporium atterimum Berk. & Curt., on stems. (Said to be the conidial stage of Dimerosporium nimbosum.) Fla., La., Pa.

Pestalotia clavata Cke. & Ell., leaf spot. N. Y. to Ala. & La.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves. Va.

Phlyctaena smilacis Cke., on stems. Fla., Texas.

Phoma sp., canker. Miss.

P. smilacis Boy. & Jacz., on stems. N. Y.

Phyllachora smilacicola Chardon, black leaf spot. P. R.

Phyllactinia corylea Pers. ex Karst., powdery mildew. Mich.

Phyllosticta spp., on leaves, sometimes causing spots. P. smilacis Ell. & Ev., and also Ell. & Mart., and P. smilacina (Pk.) Dearn. are listed under Dothiorella smilacina.

P. subeffusa (Ell. & Ev.) Tehon & Stout, leaf spot. Kans., Ill., W. Va. (Phyllostictina subeffusa (Ell. & Ev.) Petr. & Syd.)

Physalospora disrupta (Berk. & Curt.) Sacc., on stems. Ala., Miss., S. Car.

P. obtusa (Schw.) Cke., on stems. Va.

Puccinia amphigena Diet., rust (0, I). On S. bona-nox, Okla.; S. herbacea, Kans., N. Dak.; S. hispida, Kans., Nebr. II & III on Calamovilfa spp.

SMILAX spp. cont.
Puccinia macrospora (Pk.) Arth., rust (O, I). On S. glauca, N. J.; S. hispida, Kans., N. J.; S. rotundifolia, Del., N. J., N. Y. II & III on Carex spp.
P. smilacis Schw., rust (II, III). On various Smilax spp. Mass. to Fla., Texas & Nebr.; P. R. O and I on Apocynum spp.
Pyrenopeziza smilacicola Dearn. & House, on stems. N. J., N. Y.
Ramularia subrufa Ell. & Holw., leaf spot. Iowa, Miss., Nebr., Wis.
Septogloeum subnudum Davis, leaf spot. Ill., Wis.
Septoria smilacina Dur. & Mont., on leaves. La.
S. smilacis Ell. & Ev., leaf spot. W. Va.
Sphaeropsis spp., on leaves & stems. S. latisspora (Pk.) Dearn. and S. smilacis Ell. & Ev. = Haplosporella smilacis; S. smilacina Pk.= Dothiorella smilacina.
S. cruenta (Fr.) Gilman & Archer, leaf spot. Iowa.
Stagonospora smilacis (Ell. & Mart.) Sacc., leaf spot. Conn. to Md., N. Dak. & Texas.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

1939, 1940, AND 1941 ADDITIONS TO THE LIST OF CAUSES OF FUNGOUS AND BACTERIAL PLANT DISEASES IN MAINE

M. T. Hilborn

This is the third in a series listing the causes of plant diseases in Maine. The first of this series was "List of causes of fungous and bacterial plant diseases in Maine to 1936 inclusive", Plant Disease Reporter Supplement 105, 1938. The second was "1937 and 1938 additions and corrections to the list of causes of fungous and bacterial plant diseases in Maine", Plant Disease Reporter Supplement 113, 1939. This, the third in the series, brings the list up to date as far as 1941 inclusive. The list follows the same procedure as supplements 105 and 113. The sources from which the list was compiled are indicated by key letters, the meanings of which are as follows:

C = card in the file of disease records of the Department of Plant Pathology of the Maine Agricultural Experiment Station

H = herbarium of the Department of Botany, University of Maine, and the private herbaria of interested botanists at the University.

After each scientific name of a fungus are given the sources of the information, the first known date of occurrence or report of the disease, and the county in which the collection was made, where this is known.

ACER RUBRUM L. RED MAPLE
Fomes fomentarius (Fr.) Kickx H 1940 Penobscot

ANTIRRHINUM MAJUS L. SNAPDRAGON
Colletotrichum antirrhini F. C. Stewart C 1939 Waldo

CONVALLARIA MAJALIS L. LILY-OF-THE-VALLEY
Botrytis sp. C 1940 Penobscot

FRAXINUS AMERICANA L. WHITE ASH
Puccinia peridermiospora (Ellis & Tr.) Arth. C 1939 York

HORDEUM VULGARE L. BARLEY
Puccinia anomala Rostr. C 1940 Androscoggin

IRIS sp. IRIS
Didymellina iridis (Desm.) Höhn. C 1940 Kennebec

LILIUM TIGRINUM Ker. TIGER LILY
Botrytis sp. C 1940 Lincoln
Vermicularia dematium (Pers.) Fr. C 1940 Lincoln

PINUS STROBUS L. WHITE PINE
Lophodermium pinastri (Schrad.) Chev. H 1941, Penobscot, Somerset

POPULUS sp. POPLAR
Dothichiza populea Sacc. & Briard. C 1940 Aroostook

PRIMULA sp. PRIMROSE
Puccinia aristidae Tracy C 1940 Oxford

QUERCUS sp. OAK
Gnomonia veneta (Sacc. & Speg.) Kleb. C 1941 Lincoln

QUERCUS BOREALIS Michx. RED OAK
Fomes igniarius (Fr.) Kickx H 1939 Cumberland

RAPHANUS SATIVUS L. RADISH
Aphanomyces raphani Kendrick. C 1941 Somerset

RUBUS CANADENSIS L. BLACKBERRY
Kuehneola uredinis (Link) Arth. C 1939 Penobscot

RUBUS IDAEUS L. COMMON RED RASPBERRY
Pucciniastrum americanum (Farl.) Arth. C 1939 Penobscot

SOLANUM TUBEROSUM L. POTATO
Corynebacterium sepedonicum (Spieckermann & Kotthoff) Skapt. & Burkh. (Phytomonas sepedonica (Spieckermann) Magrou). C 1939 general. 1/

TSUGA CANADENSIS (L.) Carr. HEMLOCK
Pucciniastrum myrtilli (Schum.) Arth. C 1941 Knox

VIOLA sp. PANSY
Colletotrichum violae-tricoloris R. E. Sm. C 1939 Waldo

VITIS sp. GRAPE
Guignardia bidwellii (Ell.) Viala & Ravaz C 1940 Cumberland
Elsinoë ampelina Shear C 1941 Franklin

ZEA MAYS L. CORN
Cephalosporium acremonium Cda. C 1939 Kennebec
Penicillium sp. C 1941 Kennebec

(MAINE AGRICULTURAL EXPERIMENT STATION).

SOME ESTIMATES OF LOSSES FROM PLANT DISEASES IN THE UNITED STATES PRIOR TO 1917

Neil E. Stevens

From the time of its formal organization in 1917 until 1940 the Plant Disease Survey of the Bureau of Plant Industry compiled and published estimates of losses due to diseases in crop plants in the United States of America. Great as are the admitted limitations of this published material it may well furnish an important part of any history of plant diseases in the United States which may be written.

At least, any attempt to supplement the record by collecting information regarding notable outbreaks of plant diseases earlier than 1917 immediately reveals the difficulty of the undertaking and the extreme scarcity of even reasonably reliable records. The items of information published below were assembled in an effort to add to our very limited knowledge of disease losses in the United States. They are all taken from the published reports of Experiment Station Directors or in a few cases Secretaries of Boards of Agriculture. It was realized that these reports would probably yield no negative evidence, that is, reports of unusual freedom from disease, and that probably many minor epidemics would go unnoticed. On the other hand,

1/ First recorded in Maine in 1932 as a ring rot of potato caused by an unknown species of bacterium. Organism identified in 1939.

it seemed reasonable to assume that any specific mention of a disease as serious would be well based and that there might be some usable numerical estimates of disease losses.

The actual reading of the reports was financed by Works Project Administration funds. As these were withdrawn May 1, 1942, the work had to be discontinued. In view of the fact that there is little likelihood of its being taken up again at an early date, some items which seemed to be of interest are recorded herewith. These are arranged alphabetically from Alaska to Ohio, although an arrangement by hosts was planned in case the work had been carried to completion. A large number of records that conveyed no more definite information on the extent of losses than can be derived from such phrases as "great destruction", "especially harmful", "enormous losses", "very destructive", are omitted from this report although it is hoped that it will be possible to follow up some of these interesting leads.

The year indicated at the head of each paragraph is the one for which the report was written, which is usually not the year in which it was published. In most cases the disease estimate refers to that year also. All exceptions are indicated in the text.

ALASKA

Cabbage -- Clubroot -- 1915 (p. 39): Clubroot of cabbage and allied plants was unusually severe at the station the past season. The plants probably became infected in the seed flats as numerous cases of infection were observed when the plants were removed from the flats to be set in the field. About 90% of the cabbage, cauliflower, and broccoli was ruined by the disease, as was about 75% of the kohl-rabi and 40% of the Brussels sprouts and kale. Turnips and other root crops were only slightly damaged.

Potato -- Dry rot -- 1915 (p. 40): Only two potato diseases were at all common during the season. These are the scab (*Oospora scabies*) and a dry rot caused by a *Fusarium* (probably *F. oxysporum*). The scab is quite common, especially on some varieties, but the greater damage is caused by the *Fusarium*. The latter caused a loss in storage from fall to spring of 10 to 15%.

ARIZONA

Tomato -- Blight -- 1903 (p. 493): The tomato blight, a bacterial disease, causing the wilting and yellowing of leaves, and later, the dying of plants, has been reported very destructive from widely separated agricultural regions of southern Arizona. In several patches about Tucson which the writer had occasion to examine, less than five percent of the stand remained.

ARKANSAS

Apple -- Scab -- 1905 (p. 166): Scab the past season was very abundant, affecting from 50 to 90% of the fruit in unsprayed orchards.

CONNECTICUT

Tomato -- Blight -- 1890 (p. 257): The growers of tomatoes near me lost nearly their whole crop in consequence of the blight. It is apparently the result of the same fungus which attacks the potato.

CALIFORNIA

Stone Fruits -- Brown Rot -- 1900 (p. 331): Statements were received from prune growers in Napa County that 50% of the crop was rotting in some orchards, and specimens of the diseased fruit received by the Experiment Station at Berkeley showed Brown Rot to be the cause. In several large orchards in Alameda County the late variety of apricots were seriously affected; 25% or more of the crop being destroyed in some cases.

Pears -- Blight -- 1903 (p. 169): Pears - The ravages of the blight were so severe [in the San Joaquin Valley] in 1903 that the crop was an entire failure. Some of the trees are almost dead and many are so badly injured that they can never recover.

DELAWARE

Grape -- Blackrot -- 1891 (p. 40): In 1888 the black rot held complete possession of Mr. Anthony's vineyard, and, as a consequence, he obtained from 1200 vines less than 250 pounds of fruit; his loss that year being approximately 98% of a normal crop.

Currants -- Blight -- 1902 (p. 43): A peculiar blight of red and black currants has been observed in the state during the present year. In one patch of black currants near Hares Corner probably one-half of the canes were dead when I visited the place in July of the present year. The disease is doubtless identical with the one described by Mr. D. G. Fairchild in 1891 at the meeting of the Botanical Club of the Am. Assoc. for the Advancement of Science and by Mr. F. C. Stewart in Bulletin 167 of the New York Experiment Station.

Peach -- "Little peach" -- 1910 (p. 31): Little peach has been present to a much greater extent than ever before... As a rough estimate of the Kent County orchards, I should say that from 20% to 40% of the peach trees showed signs of little peach........I also believe, although with no positive proof, that many Japanese plum trees are suffering from the same disease.

FLORIDA

Potato -- Late Blight -- 1904 (p. 12): Just before harvesting the Irish potato crop of 1903, Late Blight, a fungus disease caused by *Phytophthora infestans*, made serious inroads. The loss was variously estimated at from 30 to 50% of the crop.

FLORIDA cont.

Potato -- Dry Rot [Fusarium] -- 1905 (p. 40): This is a widespread and destructive disease. . . . It is a difficult matter to find a lot of seed which is not more or less infected with it and it is not uncommon to find as high as 25% of the seed completely rotted by it. In a number of fields which came under our observation, as high as 60% of the seed was rotted by this fungus after it had been cut for planting.

Potato -- Wet Rot [Bacterial] -- 1905 (p. 41): It is not uncommon to have as high as 30% of the tubers rejected by the pickers and left in the field to rot. In several fields which came under our observation about 50% were more or less rotted when the crop was harvested.

Cabbage -- Black Rot -- 1908 (p. 75): In February, 1908, a trip was made to Sutherland, at the request of a number of vegetable growers of that section, in order to determine what disease was destroying their cabbage, cauliflower, and rutabaga crops. An examination of the fields showed that black rot was prevalent throughout the section, destroying from 25 to 75% of the crops.

Lettuce -- Lettuce Drop -- 1908 (p. 98): In a number of cases as much as 50% of the plants were destroyed.

Citrus Fruits -- Stem End Rot -- 1910 (p. 45): This disease first came to our notice in November of the past year. It affects nearly all varieties of citrus fruits, producing a decay, usually at the stem end. It caused heavy losses this year [1909]. The loss was estimated at between 5 and 30% of the fruit in affected groves.

Irish Potato -- Late Blight -- 1912 (p. 97): A serious outbreak of this disease was reported from the principal potato-growing districts of the State, and the entire crop was probably reduced by 25 to 30%.

Potato -- Late Blight -- 1913 (p. 94): The potato crop in the State was again attacked by a severe epidemic of Phytophthora infestans. In some places the crop was cut down to one-third of what was usual in other years.

Lettuce -- Lettuce Drop -- 1915 (p. 97): Lettuce drop was especially destructive and often, as in some cases observed near Sanford and McIntosh, nearly destroyed the entire crop.

Tomato -- Buckeye Rot -- 1916 (p. 89): The buckeye rot was observed by the writer to affect as much as 15% of the fruit in the field and 10% in transit.

Celery -- Black Heart -- 1916 (p. 90): The number of plants affected by the disease in some fields this season, 1915-1916, was running up to 80% of the total number of plants, and the disease is considered by some growers as second to no other disease of celery in point of damage it may do and its difficult control.

GEORGIA

Tomatoes -- Blossom-end Rot -- 1899 (p. 139): At the station, soon after the tomatoes began to form in the spring, the disease made its appearance, and by the time that they had become one-third grown, probably 60% were infested.

Peach and Plum -- Brown Rot -- 1900 (p. 353): Unusual losses have occurred throughout the State from this disease, Brown Rot. Probably not less than 40% of the crop of peaches and plums in commercial orchards has been lost.

INDIANA

Asparagus -- Rust -- 1900 (p. 10): The first knowledge of the appearance of rust upon asparagus in Indiana came to the station through Mr. L. C. Breyfogle of Crown Point, Lack County, who sent, October 2, 1899, a specimen of asparagus, thickly covered with rust, with the statement that his whole field of seven acres was in the same condition.

KANSAS

Oats -- Smut -- 1891 (p. 93): The amount of smut in oats in 1891, in the fields about Manhattan, was 5 3/4%, as shown by actual count.

Wheat -- Loose Smut -- 1891 (p. 93): The loose smut of wheat was considerable in 1891 in some of the plots on the College farm, in several cases being 5 to 7%, and in one case 16%.

Corn -- Smut -- 1896 (p. 200): Two hundred and six thousand, eight hundred and twenty-six stalks counted during the three years [1894-95-96], in about 500 fields, showed 9,716 smutted stalks, or 4.7%. The average of all counts made in August gives, however, 6.2%. The total loss then on the average is 2% of the grain crop, assuming that the smutted stalks have one-third less grain than the clean stalks. [This "assumption" is based on work reported earlier in the same paper].

KENTUCKY

Wheat -- Scab -- 1911 (p. 52): Wheat scab shows up occasionally, and while the loss from this disease is usually light, it may reach as high as 10%. In 1909 scab was very prevalent in Kentucky and most certainly reduced the yield in many fields 10%.

MAINE

Potato -- Late Blight -- 1859 (p. 200): The rot, for the last fifteen years, has destroyed nearly one half of the crop in this vicinity, [Kenduskeag, Penobscot County], and attempts have been made, here and elsewhere, to discover the cause, and to find a remedy.

MARYLAND

Peach -- Yellows -- 1904 (p. 7): One of the chief duties imposed by this law is the control of peach yellows, and it is gratifying to note that when this work was started, five years ago, [1889], 20% of the trees inspected were found to be diseased while the past year's inspection showed only two per cent.

Peach -- Yellows -- 1904 (p. 10): About 800,000 peach trees were examined and 17,110 found to be diseased with yellows, or about 2%.

Potato -- General diseases -- 1905 (p. 64): The estimated loss from potato diseases in Maryland in 1904 was fifteen per cent.

Wheat -- Scab -- 1910-11 (p. 44): It is safe to say that this year, although generally considered a good wheat year, the damage due to scabs has cut the yield, at the lowest estimate, 10%.

MASSACHUSETTS

Potato -- Late Blight -- 1890 (p. 223): Late potatoes have been an almost total loss throughout the State, on account of the attacks of the Potato-Rot fungus.

Muskmelons -- Downy Mildew -- 1903 (p. 30): During the past season (1902) muskmelons have been almost a total failure from this cause; and cucumbers both in and out of doors have been generally affected, the fungus being abundant everywhere upon these two plants.

Muskmelons -- Mildew -- 1903 (p. 31): The Alternaria disease appeared about July 15th [1902], but appeared to cause no immediate damage; but the mildew, coming on in the latter part of August, killed the vines completely all over the State, and no returns whatever were received from many large fields. After these two years of complete failure since the mildew appeared, it is probable that but few attempts will be made in the near future to grow this crop.

MISSOURI

Oats -- Rust -- 1896 (p. 9): . . . practically covered the same area as for 1895, estimated at 1,140,000 acres, but the yield declined from thirty bushels per acre to nineteen bushels, or a total yield of 34,200,000

bushels for 1895 to 21,660,000 bushels for 1896. The promise of this crop for June and July was not realized. Fields and localities that promised a phenomenally large yield about the time the head was forming were struck by rust resulting in many instances in complete destruction.

Oats -- Rust -- 1910 (p. 319): Red rust is one of the worst enemies of oats in this State. It can be found almost any season but does its greatest damage in a warm wet spring. In 1908, after such a spring, the oat crop was practically a total failure.

NEW YORK

Apple -- Apple Scab -- 1892 (p. 11): It may be remembered that two years since [1890] the apple scab destroyed seven-eighths of the apples of the fruit districts in the western part of the State, and threatened the extermination of certain varieties of apples which were of tender foliage.

Wheat -- Loose Smut -- 1907 (p. 18): The loss from the loose smut of wheat has been gradually increasing during the past three years [1905-06-07]. This year it undoubtedly destroyed at least 10% of the wheat crop of the State.

NORTH CAROLINA

Lettuce -- Lettuce Drop -- 1904 (p. 19): During the past eight years the lettuce growers in the vicinity of Wallace, N. C., have suffered heavy loss from a lettuce rot. The disease seems to have assumed a more aggravated form in the three years, 1901-1904, and in several cases the loss is estimated as high as 75%, the average being about 50%.

Tobacco -- Granville Tobacco Wilt -- 1906 (p. 71): Granville Tobacco Wilt continues to spread and is reported as worse this year. It was estimated to be 40% more destructive this year than last.

Lettuce -- Lettuce Drop -- 1906 (p. 67): Lettuce drop was collected in Cumberland, Robeson, Craven, and New Hanover counties, where it was exceedingly destructive, the loss ranging from 20 to 50%.

Lettuce -- Drop -- 1911 (p. 9): [In] the station lettuce beds 45% of plants were rendered unfit for market purposes in 1909.

Oats -- Rust -- 1897 (p. 35): Of these three varieties, Great Northern, American White Banner, and Fenton's Rust Proof, American Banner rusted 60 & 70% respectively in 1894 and 1895, the other two varieties being practically free from rust.

OHIO

Grapes -- Rot -- 1868 (p. 596): The uniform healthfulness of the vines and excellence of the crops continued almost unbroken until 1864

OHIO cont.

and 5. Rot among the Catawbas then caused alarm. In 1866, rot and leaf mildew appeared disastrously, and some crops were nearly ruined.

Grape -- Mildew and Rot -- 1869 (p. 26): The terrible mildew and rot destroyed some crops entirely, and these maladies made their appearance in regions that had previously been supposed to be exempt from their ravages.

GREAT BRITAIN

Potato -- Potato Blight and Rot -- 1872 (p. 32): The London Times estimates that the loss sustained by Great Britain the present year, in the consequence of this disease, will be from 20 to 30 millions sterling. (UNIVERSITY OF ILLINOIS).

NOTES ON DISEASES OF SOYBEANS AND OTHER LEGUMES IN OKLAHOMA

J. Harvey McLaughlin

Oklahoma weather has been very unusual thus far this year, being characterized by a late cool spring with unusually excessive rains in April and June and subnormal precipitation in May and July. This has resulted in certain irregularities in the development of diseases. Some diseases, ordinarily destructive, have been almost nonexistent, whereas others that are seldom observed have been very noticeable. The following observations have been made on diseases of soybeans and other legumes grown on the experiment station plots, surrounding farms, and gardens in the locality of Stillwater.

The bacterial pustule disease of soybeans caused by *Phytomonas phaseoli* var. *sojense* (Hedges) Burkh. was observed in a planting of varieties and selections of soybeans on the experiment station farm at Stillwater. The disease was first observed July 9, although it probably had been present for some time. Notes on the prevalence of the disease were taken on July 10 and July 28. Many varieties showing very little or none of the symptoms on July 10, were severely diseased by July 28. From a total of 30 varieties and selections of field soybeans (Table I-a) only 3, Chief, Arksoy 152, and C-146, were relatively free of the disease. None of the 27 varieties and selections of edible soybeans (Table I-b) seemed to be resistant to the disease. All were rated as severely attacked by the pathogen with the one exception of Fuji which was rated moderate. In another varietal test of field soybeans grown from locally obtained seed (Table I-c) only 3 varieties appeared to be relatively free of the disease. Habaro and Scioto were rated slightly infested and Ogden was rated as showing a trace of infection.

Table I. a. Prevalence of the bacterial pustule disease in varieties and selections of field soybeans grown principally from seed furnished by the U. S. Dept. of Agriculture.[a]

Varieties and selections severely diseased

Arksoy	Gibson	C-155	S49-12
Wilson	C-2	C-160	S-100
Macoupin	C-149	C-178	Rolsoy
Boone	C-153	L7-1160	Mukden
Patoka	C-154	S49-5	Darfield

Varieties and selections moderately diseased

Morse	C-148	L7-932	S49-18
C-6	C-175	S32-11	

Varieties and selections slightly diseased

Chief	Arksoy 152	C-146

Table I. b. Prevalence of the bacterial pustule disease in varieties and selections of edible soybeans grown principally from seed furnished by the U. S. Dept. of Agriculture.[a]

Varieties and selections severely diseased

Sousei	Hakota	Waseda	Willomi
Hahto-29	Etum	Kenuna	Chusei
Hahto-22	Rokerson	Kanro	Emperor
Hahto-2B	Toku	Higan	Bansei
Hahto-2A	Osayu	Tastee	Hokkaido
Agato	Goku	Aoda	Imperial
	Jogun	Giant Green	

Varieties and selections moderately diseased

Fuji

Table I. c. Prevalence of the bacterial pustule disease in varieties and selections of field soybeans grown from locally obtained seed.[a/]

Varieties and selections severely diseased

Arksoy	A-K Topeka, Kansas	Mamoloxi	Hollybrook
Arksoy-Tenn	Woods Early Yellow	Illini	White Biloxi
Haberlandt		A-K Rousenan in Kansas	Minsoy
Chiquita			Delsta

Varieties and selections moderately diseased

Early Yellow	Arkan 87050	Macoupin	Mam. Yellow

Varieties and selections slightly diseased

Ogden[b/]	Habaro	Sciota

a/ Scale used in obtaining the readings was as follows:

Slightly diseased -- 10 to 25% of plants diseased.
Moderately diseased -- 25 to 50% of plants diseased.
Severely diseased -- 50% or more of plants diseased.

In general, individual plants were most severely diseased in the rows having the greatest number of diseased plants within the rows.

b/ Ogden was rated as showing a trace of infection in that only occasional plants showed symptoms of the disease.

Although July has been dry, frequent dews and the presence of grasshoppers, leaf hoppers, and other insects have probably furnished the necessary conditions for spread of the disease. Considerable leaf dropping occurred in many of the varieties, particularly those rated as severely diseased. It is not known to what extent the presence of this disease will reduce the yields of the soybeans, however, under the circumstances it does not seem possible that the severely diseased plants can produce a normal yield of either foliage or fruit.

Leaf hoppers were very prevalent in the plots, apparently causing considerable leaf damage. This damage was very noticeable in certain of the edible varieties. A condition was also observed in which the terminal tips of the plants were dying, the stem tips and leaf petioles becoming somewhat wilted and very brittle. This condition was apparently associated with a large population of leaf hoppers. Attempts to isolate either fungi or bacteria from these tips were negative.

Powdery mildew, caused by Erysiphe polygoni DC., has been observed in garden plantings of cowpeas. With suitable conditions of moisture and temperature this disease can become serious in field plantings, often becoming a limiting factor in cowpea production. A leaf spotting has also been observed on Blackeye cowpeas with which a fungus tentatively designated as Phyllosticta phaseolina Sacc. has been associated. A similar spotting has been observed on Henderson's low bush lima beans.

A virus (mosaic) disease was observed in a field planting of varieties and selections of mungbeans on July 9. All varieties and selections, including the Chinese selections, appeared to be more or less infected, with symptoms of mottling, leaf distortion, and hyperplasia.

The perfect stage of Rhizoctonia solani Kühn (Corticium vagum Berk. & Curt.)[= C. solani (Prill. & Del.) Bourd. & Galz.] was found growing on the stems of garden beans in a low wet area in early June. The fungus appeared to be superficial on the stems, causing little or no damage. Severe losses of mature and nearly mature bean plants were found to be associated with the presence of Pythium aphanidermatum (Eds.) Fitz. in the diseased stem and root tissues. This disease was characterized by rapid wilting and subsequent dying of the plants. A loss of 50% or more of the plants occurred in the garden where the disease was first observed. Similar losses were seen in several other gardens in the vicinity of Stillwater. This disease was first observed June 15, at which time the soil was especially wet and the day temperatures high. Similar losses, although not so severe, were observed in tomato plants from which the same pathogen was isolated. (OKLAHOMA AGRICULTURAL EXPERIMENT STATION, STILLWATER, OKLAHOMA).

SOYBEAN DISEASES IN IOWA

G. C. Kent

An unusual amount of root necrosis occurs on the roots of soybeans. The colorless, slightly watersoaked, shrunken lesions may be found on the small laterals much more frequently than on the larger roots. In many instances the lesions have become brown and the root is dead. Pythium spp. and Rhizoctonia are prevalent and destructive. In some fields these organisms cause cankers on the hypocotyl and, not commonly, may produce damping-off. It seems certain that these pathogens will seriously reduce the soybean crop.

Bacterial blight appeared unusually early on soybeans this season and it is rapidly becoming epiphytotic. In many fields 4 to 6 trifoliate leaves already have been killed on each plant. Unfortunately, McClave is especially susceptible and is being seriously damaged all over the State.

For some unknown reason, the virus diseases are very conspicuous this season. From 5 to 25% of the plants show various types of mosaic symptoms. (From mimeographed leaflet No. 4 issued to members of the War Service Committee of Upper Mississippi Valley Plant Pathologists, July 16).

SCLEROTIUM RHIZODES ON GRASSES IN PENNSYLVANIA[1]

K. W. Kreitlow

Sclerotium rhizodes Auersw. was recently observed parasitizing leaves of *Poa pratensis* L. and *Agrostis alba* L. Since this represents the first known occurrence of the disease in Pennsylvania, periodic trips were made to the area in which the disease was discovered to observe its effects and possible spread to other hosts.

Diseased plants were first discovered in a very lightly grazed pasture along the Juniata River near Alexandria, Pennsylvania, on May 6, 1942. When first observed, the disease was most noticeable on *Poa pratensis*. Each diseased leaf was nearly white over its entire length. Those leaves that were not severely diseased often displayed a narrow tan or red zone that separated the healthy green tissue from whitened infected tissue. The most striking characteristic of the disease was the row of white or brown sclerotia that extended the length of each diseased leaf. Oettingen (4) referred to this phenomenon as the "string of pearls" disease because of the striking effect presented by the row of sclerotia.

By May 27, nearly all infected leaves of *Poa pratensis* were overgrown by non-diseased leaves of the same or neighboring plants. At that time, severe infection was noted on *Agrostis alba*, such that numerous plants were stunted and shriveled from effects of the disease. Stout (6) previously reported *Sclerotium rhizodes* on *A. hiemalis* but considered *A. alba* as resistant to infection. Davis (1) reported *S. rhizodes* as the cause of "brown patch" of grasses in New England but did not mention species of grasses involved. Flachs (3), Ekstrand (2), and Stirrup (5) reported the organism as parasitizing other species of *Agrostis* in Europe.

Sclerotium rhizodes on *Agrostis alba* formed only 1 or 2 brown or dark grey sclerotia at the junction of diseased and healthy leaf tissue. Sclerotia on leaves of *A. alba* were nearly twice the size of those on diseased leaves of *Poa pratensis*.

A number of plants were removed from the field and placed in pots in a greenhouse. New diseased leaves grew from infected culms but mycelium failed to spread to adjacent healthy plants. These observations substantiate the work of Stout (6) with respect to *Sclerotium rhizodes* on *Calamagrostis canadensis* (Michx.) Beauv.

Sclerotia from diseased leaves were plated on potato-dextrose agar. Slow but vigorous growth soon gave rise to a mat of dense, fluffy white mycelium liberally dotted with sclerotia similar to those found on diseased plants. No fruiting structures were observed and no inoculation experiments have yet been tried.

Examination of numerous pastures has not revealed the presence of the organism elsewhere. This outbreak represents either an isolated attack or else the disease was overlooked in other areas favorable for its development.

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(U. S. REGIONAL PASTURE RESEARCH LABORATORY, DIVISION OF FORAGE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH THE NORTHEASTERN STATES).

SINGLE-VIRUS STREAK OF GREENHOUSE TOMATOES

R. W. Samson

A tomato disease exhibiting symptoms suggestive of stripe (1, 6), streak or winterblight (7), glasshouse streak (5), or single-virus streak (2) was observed in considerable abundance in 6 greenhouse crops at Indianapolis, Indiana on May 29, 1942. Roughly, a trace to 20% of the plants, varying with the greenhouse, showed necrotic streaking of the upper portions of the stems and of the petioles and major leaf veins of adjacent leaves. Brown, necrotic areas were noted in the pith of the streaked stems. Necrosis of the leaves occurred as brown rings and spots, or more usually as irregular patterns of brown, necrotic lines, associated with chlorotic or bleached markings. Many more plants showed only a limited amount of leaf and petiole necrosis in addition to the rather sharply defined bleached or chlorotic areas. Careful examination revealed traces of the characteristic leaf-necrosis on still more plants that otherwise showed only a mosaic mottling. In fact, practically 100% of the plants in all houses showed mosaic mottling of the younger leaves. Fruits slightly to severely distorted and marked with depressed corky spots and broad streaks occurred on some necrotic plants and appeared to be associated with the disease.

Judging from observations of the greenhouse operators and of the extension plant pathologist and local county agent who observed the trouble

a month or more earlier, the necrotic phase of the disease was more conspicuous and injurious when the plants were younger, with only 2 or 3 clusters of fruit set, and growing rapidly. This coincided with fewer hours of sunlight and lower greenhouse temperatures.

With the advent of more cloudless days, higher greenhouse temperatures, additional fruit setting, maturity of the first fruits, and apparently a narrowing of the carbon-nitrogen ratio in the plants, development of additional necrosis was arrested and the subsequent growth of infected plants developed only mosaic symptoms.

The disease was responsible for serious losses in at least 2 of the houses, since the growers removed most of the conspicuously infected plants in an effort to stop its spread. The accompanying mosaic disease must also have reduced yields very materially in all houses. No mosaic-free plants were found that could be used as a basis of comparison, however.

The type of necrosis of stems, leaves, and fruit, the associated mosaic, the abundance of the disease (indicating a high degree of infectiousness), the circumstances under which it developed, and the results of preliminary inoculations of young tomato and Turkish tobacco plants, all have led the writer to identify the disease as single-virus streak (2). Isolated cases of apparently the same disease have been observed by the writer in Indiana greenhouses on numerous occasions in past years.

Inoculation Experiments. Young tomato plants inoculated with unheated extracts from 37 diseased plants from the Indianapolis greenhouses all developed mosaic mottling, mostly with considerable yellow blotching. Portions of the extracts heated at 75°C. for 10 minutes yielded the same symptoms on tomato as the unheated extracts. Only 2 out of a total of 222 tomato plants showed any necrosis, in the form of a very few, scattered necrotic spots. Under the same conditions some symptoms of double-virus streak (7) should have been secured if this virus complex had been present in the unheated inoculum.

Turkish tobacco plants inoculated with unheated extracts from 15 of the 37 collections developed a very clear-cut disease, characterized by the development of extensive necrosis of the inoculated leaves, vague chlorosis and necrotic flecking of next younger leaves, and a mottling of still younger leaves. This mottling was in the form of rounded or angular pale green areas that quickly became outlined by light-colored necrotic lines, producing a ring-spot type of disease. All younger leaves developed this ring-spot type of symptom complex. All tomato plants inoculated from these 15 collections developed a mosaic disease characterized by considerable yellow blotching. Transfers from such tomatoes to Turkish tobacco plants resulted in the production of the ring-spot type of disease, and, likewise, transfers from the ring-spot tobacco plants to tomato resulted in production of the yellow tomato mosaic, together with the conspicuous yellow local lesions on the inoculated leaves.

The disease produced by the virus in these 15 collections on Turkish tobacco is suggestive of that produced on this host by the plantago virus

recently described by Holmes (4). Dr. Holmes kindly supplied the writer with a stock of his virus, recently isolated from Plantago rugelii. It has been compared on tomato, Turkish tobacco, and Jimson weed with several of the writer's collections. Holmes' virus has not yet produced detectable local lesions or symptoms of systemic invasion on tomato. The symptoms produced by the 2 viruses on Turkish tobacco are similar with respect to the local lesions and ring-spotting of leaves just above the inoculated leaves, but no further symptoms have developed on the tobacco plants inoculated with Holmes' virus, while extensive mottling and initial ring-spotting has appeared on the young leaves of plants inoculated with the various collections of the writer's virus. Neither virus has produced any symptoms of systemic invasion of Jimson weed. Holmes' virus produced a large number of small, tan, necrotic lesions on the inoculated leaves of this plant, while all collections of the writer's virus have produced definitely larger local lesions. The writer's collections have not yet been tested on the various species of Plantago.

A disease closely resembling that of common tobacco mosaic developed on Turkish tobacco plants inoculated from 18 of the remaining collections. Vaguely chlorotic local lesions appeared on the inoculated leaves in a few cases, with no necrosis of the other, mottled leaves. The 4 remaining collections produced local, necrotic lesions and a systemic-tobacco-mosaic type of mottling without necrosis.

The writer is of the opinion, at present, that at least 2 viruses were present in the 37 collections, both of which are strains of tobacco mosaic, and that, in some cases, both occurred in the same tomato plant. Whether the virus producing the necrotic streak type of disease of the Indianapolis tomatoes is the same as the one producing the ring-spot type of disease on Turkish tobacco remains to be determined.

Recommended Control Measures. Assuming that the virus causing the streak disease of tomatoes in the Indianapolis greenhouses is a strain of the tobacco-mosaic virus, and, therefore, possesses some of the important properties of the latter, such as resistance to drying and aging and ease of transmission through alternate handling of diseased and healthy plants, the same control measures should apply. Infected tomato plant material should be removed from the greenhouse as completely as possible at the close of the crop season. The soil in the houses should be steam-disinfected (although most of the Indianapolis greenhouse tomato growers regularly disinfect their soil in this manner each summer or every other summer). The young seedlings for each crop should be started in steamed soil and pricked out into pots or beds of steamed soil and allowed to grow without disturbance for 2 or 3 weeks before being set out in the final location. With good growing conditions this 2- or 3-week period should be long enough for any accidentally infected plants to develop symptoms of disease and permit their detection. In the final transplanting operations extreme care should be taken not to touch any such mosaic-infected plants or plants immediately adjacent.

Alternatively, any diseased seedlings and any seedlings that may have brushed against the diseased plants should be carefully lifted and destroyed. The hands should be thoroughly washed in soap and water and rinsed in clean water before handling the remaining healthy plants in transplanting them to the permanent beds. After transplanting to the permanent beds the plants should not be handled or brushed against in tillage operations until time for the initial pruning and tying operations. The period between transplanting and tying and pruning should ordinarily be long enough for mosaic symptoms to appear on the very few plants that may have become infected up to this time. Any diseased plants or plants abnormal in any way should be carefully removed without allowing them to brush against healthy plants. After handling of diseased plants the hands should be thoroughly washed. Such precautions should be continued in all subsequent pruning, tying, and other cultural operations. It does not appear feasible to set healthy transplants in the spaces occupied by the diseased plants until any roots of the latter, still remaining in the soil, have decayed.

Such a control program should enable the greenhouse operator to delay extensive mosaic and streak infection until the plants have made most of their growth and set most of their fruit. The effects of late mosaic infection are known to be much less serious than those of early infections (3).

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(PURDUE UNIVERSITY AGR. EXP. STA., LAFAYETTE, INDIANA).

GARLIC MOSAIC IN TEXAS

G. E. Altstatt

A disease of garlic, possibly a virosis, is becoming prevalent in Texas garlic. This disease has been observed in all garlic fields visited

in the central and north Texas garlic-producing areas. The leaves of affected plants develop a mosaic or streaked pattern of white, greenish-white and yellowish colors, becoming apparent from the third to fifth months after planting. As the plant matures, symptoms become less evident, and if thrips become numerous, the mosaic symptoms may be further obscured. Most fields of garlic have from 10 to 30% of the plants affected, and in 1939, one block of about 4 acres showed 100% infection.

Experiments conducted in the field at Moulton, Texas during 1941 show that the disease is carried in the bulbs, and that by planting cloves from infected plants, the disease is carried to the new plant. It was also found that the yield from diseased plants was only 60% as much as that from healthy plants.

Incidence of Garlic Mosaic in 1942 Test*

Source of Cloves	Percentage of plants showing mosaic symptoms		
	Jan. 14	Jan. 27	Mar. 13
Field run stock	3.0	5.6	17.0
Selected mosaic-infected plants (1941)	51.8	76.5	77.1

*Planted October 11, 1941

Nothing is known of the part insects may play in transmitting the disease from plant to plant. Artificial inoculations by grafting, hypodermic needle injection, leaf pricking and leaf abrasions were made during the 1941-42 season, but symptoms were not apparent during that season. Bulbs from inoculated plants, however, have been saved and will be planted in the fall of 1942, and observed for symptoms of mosaic.
(TEXAS AGRICULTURAL EXPERIMENT STATION).

OBSERVATIONS ON CUCURBIT DOWNY MILDEW IN SOUTH CAROLINA

C. J. Nusbaum

For the first time since 1938, cucurbit downy mildew, Pseudoperonospora cubensis, was destructive this year in South Carolina. In Barnwell County the first infection center, which comprised only 3 lesions on 1 plant, was found in a field of cucumbers on May 30, 1942, 3 weeks earlier than the first appearance recorded in 1941. Several scattered foci of infection, all of recent origin, were found 3 days later. The disease spread very quickly on cucumber and cantaloupe.

Many cucumber fields showed heavy infection by June 12 and complete destruction by June 20. Nevertheless, cucumber harvest was approaching its peak when mildew appeared and satisfactory returns were obtained by most growers before the vines succumbed to the disease.

The first infection upon cantaloupes was found on June 6. However, cantaloupes, being about 3 weeks later than cucumbers, suffered greater damage. In some fields mildew had caused some defoliation before June 22, when harvest began. Heavy defoliation, which followed, caused a considerable portion of the fruit to ripen prematurely, resulting in reduced quality and yield. Peak harvest was reached about one week in advance of expectations and ended about July 1.

The economic effect of downy mildew on cantaloupes in South Carolina is complicated by the marketing practices employed. A large portion of the crops is sold in bulk and growers prefer earliness, even though premature, to quality in order to gain the higher prices which the first fruits invariably bring. Therefore, until a marketing system based upon a quality product is established, downy mildew control practices will probably not find popular favor.

Downy mildew appeared on watermelon foliage during mid-June but was much less severe on this crop than upon cucumber and cantaloupe.

The results of downy mildew control experiments with cucumber and cantaloupe will be reported at a later date.

(EDISTO EXPERIMENT STATION, BLACKVILLE, S. C.).

TOMATO DISEASES REPORTED FROM NEW YORK

(From Weekly News Letter for dates indicated)

Early blight was rather generally reported, although not always as important. In Wayne County replanting was necessary in some fields of southern-grown tomatoes, while others were harrowed and planted to another crop because losses of about 50% resulted from weather favorable to early blight development, according to W. D. Tyler (June 22). Wm. J. Clark reported the disease as widespread in Rockland County, with considerable defoliation and some fruit loss (July 20), causing a probable reduction in the crop of early tomatoes of 25 to 50% (August 3). M. E. Buckley and E. G. Heath reported some defoliation and fruit rotting from early blight in Westchester County (August 10).

Bacterial canker (*Phytomonas michiganensis*) from seedbed infection was severe in affected fields on Staten Island and some would be plowed under, according to A. A. Foster (July 20). C. G. Small reported occasional cases in Ulster County (August 10). Severe fusarium wilt appeared in Wayne County in tomato plots from southern sources (W. D. Tyler, July 27). Late blight (*Phytophthora infestans*) was reported from Nassau County (Long Island) by F. M. Gordon (July 20). In Niagara County D. M. Dalrymple reported *Septoria lycopersici* on tomatoes from untreated seed, early varieties, not sprayed in the plant house (July 20); and a disease that seemed to be verticillium wilt (*V. albo-atrum*) appearing in victory gardens (July 27). Septoria blight is also present in Ulster County according to C. G. Small (August 10).

Streak (virus) was observed in a planting of southern-grown tomatoes in Nassau County, according to F. M. Gordon (July 20). In Ulster County

Cyril G. Small reported an unusual outbreak of cucumber mosaic on tomatoes, with particularly severe symptoms (July 13); however, tobacco mosaic is causing most of the injury attributable to mosaic in that county. (August 10). In Westchester County both streak and mosaic are present in some commercial fields and many home gardens, according to M. E. Buckley and E. G. Heath (August 10).

Fruit scald caused considerable loss in Rockland County, according to Wm. J. Clark, who reported, "High temperatures last weekend and bright sun caused considerable losses on tomatoes. Many of the fruits of the varieties Victor and Valiant were seriously scalded. One of our large vegetable growers tells me that even though tomatoes were not noticeably scalded, they seem to have a cooked appearance. Fruits that were nearly ripe were too badly injured to be sold at all." (July 27).

From Monroe County, Ralph G. Palmer reported (July 27) "Greenhouse tomatoes have not done well this spring. The weather in April, May, and early June was such that soil temperatures were rather low for tomatoes, even dipping into the 50°F. range. Size is below average, with a great deal of streak and mosaic [virus], and leaf mold [Cladosporium fulvum]. Earlier, when it was cooler, some ring-spot [virus] was found to be serious in several ranges. Outdoor stake or trellis tomatoes also show a great deal of mosaic with some streak. With warmer weather the mosaic may not be so injurious although it definitely interferes with fruit setting. Canning factory tomatoes are below average, owing to late setting and cool weather. Lack of moisture did not help. Recent rain and wind storms have broken branches and considerable areas have suffered more or less drowning out." Later (August 3) "The crop is still below average. A very small amount of alternaria blight [A. solani] is showing up. More or less wilt (presumably Fusarium [bulbigenum] lycopersici) is appearing in fields planted with southern-grown, certified plants."

VEGETABLE DISEASES IN MASSACHUSETTS

O. C. Boyd

On July 29 and 30, I visited several vegetable and potato fields in the Dighton and Westport sections of Bristol County. Tomato early blight [Alternaria solani] was present in all fields and caused defoliation in unsprayed plantings ranging from about 10 to 40%, with harvesting only a few days under way. The worst case was observed on a strain of greenhouse-forcing Comet grown unstaked and unpruned in the field. One field of tomatoes showed at least 50% defoliation by Septoria lycopersici. That grower practices crop rotation and saves his own seed but does not disinfect it. One case of early infection tomato late blight was observed, causing typical Phytophthora infestans injury to foliage and fruits. Another moderate infection by this disease was observed yesterday (August 4) in a Connecticut Valley tomato field in Franklin County. This is rather early for this trouble to be showing up.

Several cucumber fields were examined in Bristol County July 29 and 30,

and in Franklin County yesterday, but no trace of downy mildew was observed. However, angular leaf spot [Phytomonas lachrymans] had increased considerably and mosaic [virus] and scab [Cladosporium cucumerinum] enormously since the farm visits in Franklin County on July 23. In fact, the pickle fields visited yesterday in the Connecticut Valley and in the Franklin County hill towns showed from 10 to 100% plant infection with either scab or mosaic, or both. Once harvesting is started, the fields are soon overrun with mosaic, which cuts short vine-growth and fruiting and results in Number 2 pickles. Nevertheless, bacterial wilt [Erwinia tracheiphila], angular leaf spot, and mosaic are not so severe as they were last season, while scab is definitely worse. Anthracnose [Colletotrichum lagenarium] is about the same. One light leaf infection of Diplodina (Mycosphaerella citrullina) was observed on cucumbers in Bristol County.
(MASSACHUSETTS STATE COLLEGE. August 5).

PLANT DISEASES OCCURRING IN NEBRASKA PRIOR TO JULY 18, 1942

J. E. Livingston

The 1942 season has been one of the most favorable seasons in recent years for the development of plant diseases in Nebraska. Abundant driving rains and cool temperatures lasting into July favored the development and spread of many of the more serious diseases.

Barley was a total loss in a few fields from root rot (probably species of Helminthosporium and Fusarium, on the basis of limited isolations) and a large percentage of the fields in southern Nebraska suffered a 25% loss. In addition, there was from 15 to 20% loose smut of barley (Ustilago nuda), and with conditions favorable for floral infection this past spring, much of the seed supply for next year may be infected. A few samples of blighted barley heads (Helminthosporium spp.) are being received.

One of the highest yielding crops of winter wheat in the history of the State is now being harvested. Black stem rust [Puccinia graminis] was damaging in only 2 areas; one paralleling the North Platte Valley in Garden, Deuel, and Keith Counties, and the other extending south from Rushville in Sheridan County. Spring wheat may still be injured to some extent by black stem rust. Leaf rust [P. rubigo-vera tritici] infection was very heavy in most fields. It appeared at the earliest date on record (March 22) but developed slowly and although it caused considerable defoliation, its slow development apparently prevented serious damage. Septoria tritici and Erysiphe graminis were prevalent but unimportant. Dry-land root rot of wheat was prevalent in the region of Deuel, Keith, and Perkins Counties. Root rot was also observed in limited amounts in other areas of the State and with considerable lodging in wheat and rye one wonders if root rot may have been a contributing factor.

Beans in many small, home gardens were completely destroyed by bacterial halo blight (Phytomonas medicaginis var. phaseolicola) and quite a few

were also infected with common bacterial blight (Phytomonas phaseoli). Mosaic [virus] was responsible for about a 5% loss. No reports are yet available on the blight in field beans in western Nebraska, but with an increased acreage this year there will probably be considerable loss from common blight which is the principal disease of this crop.

Tomato bacterial speck (Phytomonas punctulans) has been abundant, although it did not cause as much damage as bacterial spot (P. vesicatoria) which was present in smaller amounts but caused the loss of a large percentage of the fruits attacked. Septoria lycopersici was present in nearly every tomato field on the lower leaves. It caused some defoliation but was not serious. Some mosaic was also present.

Potato early blight (Alternaria solani) appeared in epidemic form in the central Platte Valley. Several of the growers estimated that the yield of the Red Warba variety was reduced from 60 to 70 bushels per acre in some fields. This is the second year that early blight has occurred in this region. Ring rot (Phytomonas sepedonica)[Corynebacterium] continues to be a problem in this section of the State. Very little certified seed of the Red Warba and Irish Cobbler varieties is produced in Nebraska and imported certified seed has carried enough ring-rot infection that many growers are beginning to wonder if certified seed is worth the money. Rhizoctonia solani caused a loss of from 2 to 3% of the plants and a few plants in most fields were lost from blackleg (Erwinia carotovora).

Most of the cabbage plants are imported and in many fields there was up to 5% infection from black rot (Phytomonas campestris). Only a few fields with yellows (Fusarium conglutinans) were observed as most of the growers use yellows-resistant varieties. Cucurbit bacterial wilt (Erwinia tracheiphila) was widespread, a few infected plants being observed in most fields. It appeared to be most prevalent on muskmelons.

Root rot of peas (cause not determined) was very serious with many varieties. The early varieties suffered more than the late. In a seed treatment test at Lincoln, the Surprise variety (early) showed 20% root rot and the Alderman variety (late) was free from the disease. Mildew (Erysiphe polygoni) caused some local damage, as did also Phytomonas pisi and Ascochyta blight.

Cercospora beticola developed on garden beets so that by the end of the season the leaves were nearly covered with spots.

Peppers lost about 10% of their leaves in many of the commercial fields from Phytomonas vesicatoria. The fruits were just beginning to show the disease at the time these observations were made. Much the same situation exists with eggplants infected with Phomopsis vexans. According to one grower who specializes in producing eggplants, he has been having considerable trouble from this disease for several years.

Raspberry anthracnose (Plectodiscella [Elsinoë] veneta) was severe in the counties bordering the Missouri River. In many cases the canes were being killed and defoliation had set in by the 15th of June.

Strawberry leaf spot (Mycosphaerella fragariae) caused considerable defoliation and stunting of plants.

Sycamore anthracnose (Gnomonia veneta) caused from 60 to 75% defoliation of about 75% of the trees in eastern Nebraska. A second set of leaves has now developed and they appear to be healthy.

Elm leaf spot (Gnomonia veneta) is becoming prevalent on American and Chinese elms.

Bacterial blight (Bacterium [Phytomonas] syringae) on lilacs was widespread and caused some defoliation.

Fire blight (Erwinia amylovora) on apple and pear was present in many orchards, especially the small, home orchards.
(UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE).

SOME NEW RECORDS FOR VERTICILLIUM DISEASES

VERTICILLIUM WILT OF COTTON FOUND IN THE RED RIVER SECTION OF LOUISIANA: Specimens of cotton plants collected by C. C. McCrory, County Agent, Shreveport, Louisiana and recently forwarded to the Bureau of Plant Industry laboratory at the Louisiana State University, have been examined and found to be affected with the Verticillium disease.

This appears to be the first record of Verticillium albo-atrum in Louisiana. The disease has previously been reported from the sections of Arkansas, Mississippi, Tennessee, and Missouri adjacent to the Mississippi River. It frequently causes serious damage to cotton in the irrigated sections of Texas, New Mexico, Arizona, and California. In these sections recent experiments have shown considerable promise for the possibility of developing resistant varieties. (D. C. Neal, Division of Cotton and Other Fiber Crops and Diseases).

NEW ORNAMENTAL SUSCEPTS OF VERTICILLIUM: In December 1940 (Phytopath. 30: 1054-1055. 1940) the writer briefly discussed the importance of Verticillium as a pathogen of ornamental plants and listed a number of new ornamental suscepts. Since that time, Verticillium has been isolated from the following ornamental plants that were submitted to this laboratory: Begonia sp. (Hort. var. Lucile), Calceolaria sp., Glaucium flavum, Polemonium van-bruntiae, Papaver pilosum, Rudbeckia hirta, Coreopsis lanceolata, Impatiens balsamina, Callirhoë papaver, and Rosa hugonis. All of the plants exhibited typical symptoms of verticillium hadromycosis and Verticillium was isolated in pure culture from vascular tissues. Although inoculation studies have not been undertaken, there is little doubt concerning the pathogenicity of the Verticillium isolates obtained. The writer has found no previous report of the susceptibility of any of these plants to Verticillium.
(A. W. Dimock, Cornell University, Ithaca, N. Y.).

SUSCEPTIBILITY OF SOME COMMON ROSE UNDERSTOCKS TO NEMATODE ROOT KNOT

G. E. Altstatt

Cuttings of a number of rose understocks were rooted in deep sand in the greenhouse during 1941 and 1942. After the cuttings were planted, the sand was inoculated by spraying a suspension of larvae and eggs of the root knot nematode, Heterodera marioni, over the surface and washing the inoculum into the sand with water. (The inoculum was prepared by suspending infested rose or tomato roots over water in a covered bell jar. After 48 hours the nematodes and eggs began to appear in the water.) A nutrient solution containing calcium nitrate, magnesium sulphate, ammonium sulphate, and potassium phosphate was added occasionally to the sand to hasten the growth of the cuttings. About 9 months after inoculation, the cuttings were removed for examination and the relative amounts of nematode infestation found are noted in the table below. R. multiflora X R. blanda understock was the only one that was free from root knot following this inoculation. The other kinds of rootstock showed infection varying from slight to severe.

Nematode susceptibility of rose understocks

Understock	Degree of nematode infestation*
Rosa multiflora Welch	severe
multiflora upright	slight
multiflora Shafter	medium
multiflora Chenault	severe
multiflora x R. blanda	none
odorata	severe
setigera	slight
manetti	severe
blanda	severe
Ragged Robin (Gloire des Rosomanes)	slight
Texas Wax	severe
Texas Wax Thornless	medium
R. multiflora Welch x R. multiflora Chenault (#62)	severe

* slight = trace to 10% of roots with knots.
medium = 10 - 40%.
severe = 40% and over.

(TEXAS AGRICULTURAL EXPERIMENT STATION, COLLEGE STATION, TEXAS).

REPORTS ON POTATO LATE BLIGHT

The Weekly Weather and Crop Bulletin of the Department of Commerce Weather Bureau, for the week ending August 11, reports "blight" and "rotting", presumably late blight, in New England, West Virginia, and Michigan.

LATE BLIGHT IN NORTH DAKOTA: I am sending specimens of Phytophthora infestans on potato, from Grand Forks in the Red River Valley, August 10. I also found the disease in North Dakota near Park River, Cando, and Devil's Lake, and in Minnesota at East Grand Forks and Hawley. (G. H. Godfrey, Texas Agricultural Experiment Station).

RHODE ISLAND: Our Cobbler potatoes had all of their foliage dead by August 15 in spite of 7 applications of Bordeaux mixture 5-5-50. Late blight was first reported on July 21 and it has increased remarkably in the past 2 weeks owing to the unusually rainy weather. Unsprayed Green Mountain potatoes are 100% dead. Those sprayed with 2-2-100 Bordeaux mixture are better than 95% dead. Those having 6-6-100 Bordeaux mixture are about 60% dead. Those sprayed with 18-18-100 Bordeaux have at least 90% of their foliage. These Green Mountains have only had 4 applications.

The rainfall at our local official station has been as follows:

	Inches		Inches
July 2	.33	August 9	1.66
3	1.62	10	.08
6	.08	13	1.06
11	.74	14	1.08
14	.90	17	.22
18	.26	18	1.40
27	.17	August total	
28	.13	to date	5.50
31	.03		
July total	3.26		

This is apparently a blight epiphytotic year which occurs about once out of every four or five. (Frank L. Howard, Rhode Island Agricultural Experiment Station, August 20).

LATE BLIGHT OF POTATOES PREVALENT IN NEW YORK (from Weekly News Letter, August 10): Late blight has now been found in potato fields in 21 counties, including Long Island and the western, central, and northern parts of the State. It probably exists in other counties. In most of the fields observed, it appears in small areas or on a few leaves of many plants scattered throughout the field and has not done material damage. It is much more severe in a few fields where it apparently

started early. Many muck fields are infected, but the disease is not so prevalent in upland fields of western New York except in valleys and other places favorably located for its development. Well-sprayed fields seem to have been protected to a large extent. However, the fact that the disease is widely distributed throughout many fields in all parts of the State indicates that further spread is certain to occur, given weather at all favorable for its development. It seems likely to become the most destructive disease of potatoes this year. Growers should spray or dust their potato fields frequently and thoroughly the remainder of the season. (M. F. Barrus).

BRIEF NOTES ON PLANT DISEASES AND A CORRECTION

DOWNY MILDEW ON CELTUCE (LACTUCA) IN PENNSYLVANIA: George L. Zundel sent specimens of Bremia lactucae on this new vegetable, collected from his garden at State College, August 4.

SCARCITY OF SWEET CORN BACTERIAL WILT: In Nassau County on Long Island, according to F. M. Gordon, "Stewart's disease [Phytomonas stewarti] on sweet corn has been very scarce here this summer. This may be due to 2 reasons: (1) the general practice of growing resistant hybrids, and (2) the scarcity of the corn flea beetle." (August 10).

O. C. Boyd reports from Massachusetts, "Not a single stalk of Stewart's wilt has been observed in sweet corn this year, even in Bristol County where there ordinarily is at least a small amount each year. Possibly the very cold snap (18 to 20°F. below zero) that killed peach buds throughout the southern and southeastern parts of the State may have reduced the overwintering corn flea beetles to a minimum." (August 5).

PARASITIZATION OF RUSTS IN KANSAS: I have recently collected Puccinia rubigo-vera on Elymus virginicus and E. canadensis, and P. tripsaci on Tripsacum dactyloides, all heavily parasitized by an organism resembling Darluca filum. Apparently this is a good year for the parasitization of rust in Kansas. (C. O. Johnston, Division of Cereal Crops and Diseases. August 3).

SOURCES OF ERGOT FOR DRUG PURPOSES: During the past year, drug laboratories have inquired regarding the possibilities of obtaining rye ergot, since the European supply is cut off. We now have around Brookings, South Dakota, an unusual amount of ergot [Claviceps purpurea], enough to warrant consideration for gathering by such companies. There is enough rye in eastern South Dakota to harbor an abundance of the drug if it is as abundant elsewhere as here, and there is no reason for its being otherwise. (Abstract in mimeographed letter Number 4 of the War Service Committee, Upper Mississippi Valley Plant Pathologists, of letter from W. F. Buchholtz, July 10).

A CORRECTION: On page 246 of the June 15 issue, the title should read "A disease of wheat newly recorded for this country", instead of "county".

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THE PLANT DISEASE REPORTER

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'he Plant Disease Reporter is issued as a service to plant pathologists ·hroughout the United States. It contains reports, summaries, observations, ind comments submitted voluntarily by qualified observers. These reports ›ften are in the form of suggestions, queries, and opinions, frequently pure-·y tentative, offered for consideration or discussion rather than as mat-·ers of established fact. In accepting and publishing this material the ›ivision of Mycology and Disease Survey serves merely as an informational ·learing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

Bowen S. Crandall, page 376, reports a disease of honey locust.

R. W. Leukel, page 376, concludes that although Spergon and Thiosan are .ess effective than the usual seed treatments for small grains they may e considered suitable substitutes when better materials are unavailable.

Incidence of wheat and barley scab in Virginia is reported by ·. B. Fenne, page 379. George F. Weber reports scab on Paspalum in 'lorida. According to Roderick Sprague, true scab is absent from western orth Dakota, but black chaff is serious and a number of head molds are ommon.

Leaf blight is unusually prevalent on field corn in Pennsylvania and hio, according to George L. Zundel and C. C. Allison, respectively, . 379. J. A. Pinckard reports a leaf spot of corn caused by Diplodia acrospora, in Mississippi.

C. A. Suneson reports on the incidence of small grain diseases in the orthwest and Intermountain regions, page 380.

Frank L. Howard reports what seems to be a virus disease on edible oybeans in Rhode Island, page 381. Tobacco ring-spot affected an Indiana lanting in 1941, according to R. W. Samson. Additional reports on soy-ean diseases are given from Virginia and from North Dakota, by S.B.Fenne nd by Roderick Sprague. The frog-eye leaf spot is reported from aryland and from Virginia for the first time, by M. W. Woods and by . B. Fenne.

A number of brief reports have been received on late blight and other iseases of potatoes and tomatoes, page 383.

Brief notes, page 384, include fire blight on pears in Florida, by eorge F. Weber, Spergon as a growth stimulant, appearance of a plant dis-ase in fiction, and a correction.

Check list revision, by Freeman Weiss, page 385.

THYRONECTRIA DISEASE OF HONEY LOCUST IN THE SOUTH

Bowen S. Crandall

During a study of persimmon wilt in Tennessee and adjacent States the writer's attention was called to an apparently serious disease of honey locust (Gleditsia triacanthos). Often, on being given a description of the persimmon disease, farmers would state that they had seen it and that the same disease was also attacking their honey locust trees.

The affected honey locust proved to be the victims of a canker disease of the bark of the smaller branches. Typically, cankers range from the size of a pin head to a half inch in diameter. They eventually enlarge or coalesce and girdle the branch. The causal agent also penetrates the vascular system, producing reddish-brown streaking of the outer wood for several inches in each direction from the visible canker. A gummy exudate also occurs on many of the cankers.

In the Tennessee area trees are apparently killed by this disease, probably as a result of the multiple branch infections. Trees in early stages of attack show branches with wilted foliage and dead limbs or branch ends. Later the entire tree is affected gradually and dies. On many areas healthy trees are found adjacent to infected or dying trees. The writer has observed such trees remaining free from infection for a number of consecutive seasons. It is therefore believed that a considerable amount of natural resistance to this disease is present.

From the cankers and streaks in the vascular system a single fungus was isolated, which was identified as Thyronectria austro-americana Seeler. Isolates from Tennessee and Mississippi were submitted to Seeler, who confirmed the identification. The disease is apparently the same as that described by Seeler[1] from Massachusetts on Gleditsia japonica and G. triacanthos. The writer has observed it throughout middle and western Tennessee and the northern half of Mississippi and Alabama.

The Division of Forest Pathology would like to have seedlings from trees apparently resistant to the Thyronectria disease if the seedlings can be obtained. We will appreciate receiving seed, in any amount, from such trees. Seed should be sent to the writer at the School of Forestry, University of Georgia, Athens, Georgia.

(DIVISION OF FOREST PATHOLOGY, U. S. BUREAU OF PLANT INDUSTRY).

SPERGON AND THIOSAN AS SEED TREATMENTS FOR SMALL GRAINS

R. W. Leukel

Spergon, which in 1941 proved satisfactory as a fungicied for the control of covered kernel smut of sorghum[1], was tested during the past season as

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1/ Seeler, Edgar V., Jr. Two diseases of Gleditsia caused by a species of Thyronectria. Journ. Arnold Arboretum 21:405-427. 1940.

1/ Leukel, R. W. Spergon as a seed disinfectant for sorghum. U. S. Dept. Agr., Bur. Pl. Indus. Pl. Dis. Rptr. 26(4): 93-94. March 1942.

a preventive for bunt of wheat, loose and covered smuts of oats, and covered smut of barley. It had been planned to include also Thiosan (50% tetramethyl thiuramdisulfide) in these tests, but unfortunately this material was available only for use on the barley.

The experiment on the control of bunt was carried out at the Ft. Hays Experiment Station, Hays, Kansas, through the cooperation of A. F. Swanson.

Seed of Tenmarq wheat was inoculated with bunt spores at a 1:100 spore dosage and separate portions were dusted with Spergon and copper carbonate at the rate of 2 ounces per bushel. The treated and untreated seed was sown in the field in rod rows in October 1941. The data on bunt control, taken in June 1942, showed 15% bunt infection in the check rows, a slight trace (2 heads) in the rows from Spergon-treated seed, and none from copper carbonate-treated seed.

The relatively low infection in the controls render the results somewhat inconclusive, but, nevertheless, they indicate that Spergon has possibilities as a fungicide for bunt control.

The only seed immediately available for the experiment on oat smut control was a small lot of Canadian oats naturally infected with both of the oat smuts. Half of this seed was artificially inoculated with spores of covered smut by the partial-vacuum method. The other half received no artificial inoculation. Separate portions of each lot were treated with New Improved Ceresan at the rate of 1/2 ounce per bushel, Spergon at 3 ounces per bushel, formaldehyde, and a mixture of 1 part Ceresan and 3 parts Spergon at the rate of 1 ounce per bushel. This last portion was to have been treated with Thiosan, but this material was not on hand when the oats were treated.

Later, Odessa barley was inoculated with covered smut by the partial-vacuum method and separate portions were treated with New Improved Ceresan at 1/2 ounce per bushel, Spergon, and Thiosan, both at 3 ounces per bushel, and formaldehyde.

The treated and untreated oats and barley were sown in the field in triplicated rod rows at Beltsville, Maryland, April 25, 1942. In addition, 500 seeds of each lot were sown in the greenhouse to secure data on the effect of the treatments on germination. Similar field plantings were made also at four other stations through the helpful cooperation of the following investigators, who also took the data on smut control at their respective stations: W. T. Craig and V. F. Tapke at Ithaca, New York; H. C. Murphy at Ames, Iowa; Harland Stevens at Aberdeen, Idaho; and E. D. Hansing at Manhattan, Kansas. No smut developed in the field plots at Beltsville, Maryland, because of the unfavorable conditions brought about by a heavy snow that fell shortly after the seed was sown. The data on germination obtained in the greenhouse at Beltsville, together with the data on smut control obtained at the 4 other stations are presented in Table 1.

Spergon was fairly effective against oat smut resulting from natural infection but not against the smut induced in oats by artificial inoculation by the partial-vacuum method. Furthermore, E. D. Hansing informed the writer that in more extensive experiments at Manhattan, Kansas, Spergon did not appreciably reduce the percentage of smut in Kanota oats

similarly inoculated. It has been pointed out, however[2/] that, in oats, inoculated by the partial-vacuum method, smut is much more difficult to control than in naturally infected seed. Therefore, until Spergon is tested further on oats that carry a heavy natural infection, it should not be eliminated entirely as a possible substitute for oat seed treatments known to be effective.

Although Spergon and Thiosan were not as effective as New Improved Ceresan or formaldehyde in the control of covered smut in Odessa barley, they controlled this disease fairly well and, if better materials are unavailable, they may be considered as suitable substitutes.

Table 1. -Effect of certain seed disinfectants on emergence of oats and barley and on the occurrence of loose and covered smuts of oats and covered smut of barley.

Seed disinfectant	Percentage of heads smutted at - Ithaca, New York	Ames, Iowa	Aberdeen, Idaho	Manhattan, Kansas	All stations	Percent emergence
	Oats - naturally infected seed					
Untreated control	3.9	2.3	5.7	11.1	5.8	93
New Improved Ceresan	.0	.0	.0	.2	T[a/]	93
Spergon	.1	1.2	.4	.7	.6	95
Formaldehyde[b/]	.0	.0	.0	.6	.2	86
Mixture[c/]	.0	1.2	.0	.7	.5	95
	Oats - artificially inoculated seed					
Untreated control	44.4	6.3	20.3	13.1	21.1	92
New Improved Ceresan	.3	.0	.4	.4	.3	92
Spergon	24.4	4.7	17.5	9.1	13.9	93
Formaldehyde[b/]	.0	.0	.0	.5	.1	82
Mixture[c/]	.5	.0	.3	.7	.4	86
	Barley - artificially inoculated seed					
Untreated control	24.1	5.0	34.8	29.0	23.2	89
New Improved Ceresan	.0	.0	.1	.0	T	96
Spergon	1.1	.2	2.6	1.9	1.5	91
Formaldehyde[d/]	.0	.0	.0	.2	T	87
Thiosan	.6	.6	1.6	1.8	.9	87

a/ Trace or less than 0.1 percent.
b/ Seed dipped in a 1:320 solution, drained, covered for 4 hours, washed in running water, and dried thoroughly.
c/ Spergon, 3 parts, and New Improved Ceresan, 1 part.
d/ Seed soaked in 1:320 solution for 1 hour, covered and drained for 1 hour, washed in running water and thoroughly dried.

(DIVISION OF CEREAL CROPS AND DISEASES).

2/ Leukel, R. W. Seed treatment experiments with oats naturally and artificially inoculated with smuts. U. S. Dept. Agr. Techn. Bull. 568. May 1937.

REPORTS ON SCAB OF CEREALS AND GRASSES

BARLEY AND WHEAT SCAB IN VIRGINIA: Much of the barley escaped severe scab (Gibberella saubinetii [= G. zeae]) injury during the spring of 1942, because it was harvested before the wet season began, but wheat suffered considerable damage late in the season. Although very few blasted heads resulted, the disease spread rapidly during the protracted wet weather just before and during harvest. Damage caused by scab was probably considerably less than in 1940, although greater than in 1941. (S. B. Fenne, Extension Plant Pathologist).

SCAB ON PASPALUM NOTATUM IN FLORIDA: Near Gainesville, scab (Fusarium sp.) appears to be more conspicuous on Paspalum notatum this year than previously. There are no extensive plantings of cereal crops except corn in this vicinity. (George F. Weber, Florida Agricultural Experiment Station).

WHEAT AND BARLEY SCAB ABSENT IN WESTERN NORTH DAKOTA: No scab has been located in central and western North Dakota. It has been reported as far west as Valley City, but authentic reports limit it to the usual narrow strip in eastern and southeastern North Dakota. What is locally called scab is mostly black chaff (Bacterium translucens var. undulosum). Black chaff is very serious this year. Regent wheat is particularly hard hit by it. Other conditions attributed to scab on the matured glumes are due to molds such as Alternaria tenuis, Cladosporium herbarum, and Fusarium sporotrichoides, all of which are more or less common this year in areas where rains were heavy.

Our isolations from rootrot material again show that Fusarium graminearum and F. culmorum, scab-causing fungi, are virtually non-existent in western and central North Dakota on cereals and grasses. Sometimes F. graminearum and F. culmorum are isolated from Echinochloa crus-galli which had been growing in ditches. F. culmorum was, however, frequently isolated from the roots of oats and certain grasses in the Palouse region near Pullman, Washington in May of this year. (Roderick Sprague, Division of Cereal Crops and Diseases, Northern Great Plains Field Station, Mandan, N. Dak., Aug. 20).

UNUSUAL OCCURRENCE OF SOME CORN DISEASES

HELMINTHOSPORIUM LEAF BLIGHT ON FIELD CORN: Reports of an unusual amount of damage caused by Helminthosporium turcicum have been received from Pennsylvania and Ohio:

Pennsylvania: Helminthosporium leaf blight will cause loss in our hybrid field corn this year. The destruction is very severe wherever I went this week. Some varieties of field corn hybrids have all of the lower leaves killed and browned so that the fodder will be spoiled for silage purposes. In some cases the ears are drooping owing to the weakening of their stalks. Some of the fields look as though they had been struck with frost and then scorched with fire. I have found the disease

in Adams, Franklin, Cumberland, Dauphin, and Lebanon Counties. I have not been in other counties but am almost sure that it is statewide. (George L. Zundel, Pennsylvania State College. August 22).

Ohio: Helminthosporium turcicum is present in almost all corn fields in the southern half of Ohio. Damage to the fodder will be severe on susceptible hybrids. In some fields the injury will result in spongy corn and a reduction in yield. Extensive damage has developed in corn fields farther north than in 1939 and 1941. (C. C. Allison, Extension Plant Pathologist. August 25).

DIPLODIA MACROSPORA CAUSING LEAF SPOT IN MISSISSIPPI: The leaf spot on corn caused by Diplodia macrospora, specimens of which I sent to you some time ago, has been present on practically every corn plant I have seen in the State. It occurs throughout the entire length and breadth of Mississippi. I am uncertain as to the damage that it is causing as a sheath rot or stalk rot because several other fungi produce confusing symptoms. The leaf spots frequently merge with those due to other causes and in cases of severe firing it is impossible to determine if the Diplodia is responsible. In many instances where the disease can be found without complicated symptoms the leaf area affected ranges from an isolated leaf spot to approximately half of a leaf. The overall damage is probably 10 to 20%. This fungus has been reported on corn leaves from Florida by A. H. Eddins (Phytopath. 20:439). (J. A. Pinckard, State Plant Board of Mississippi. August 24).

CEREAL DISEASES IN THE PACIFIC NORTHWEST AND INTERMOUNTAIN STATES IN 1942

C. A. Suneson

Crop yields in the Northwest and Intermountain region will generally be above average, particularly in central Washington and Oregon.

My survey indicates that there will be considerably more bunt [Tilletia] than in 1941 in both marketing areas. This may be due to: (1) favorable conditions for fall infection, (2) increased acreage of susceptible varieties, and (3) a greater proportion of winter wheat.

Dwarf bunt must be considered the major disease problem in Turkey areas. It was unusually severe in Utah and in Gallatin Valley, [Montana] where recent Ridit hybrid releases, such as C.I. 11599, showed 10 to 30% dwarf bunt in commercial fields. The resistance of Relief and Hymar, among others, is still satisfactory in all dwarf bunt areas, however. Dwarf bunt was observed for the first time in trace to 5% amounts over most of the winter wheat lands of eastern Idaho. In northern Idaho there was less dwarf bunt than in any season since 1937. This may have resulted from virtual elimination of the crop-fallow rotation in this area with increased rainfall.

Flag smut [Urocystis tritici = U. agropyri according to Fischer[1/]] will receive considerable experimental attention in Washington next year.

Loose smut [Ustilago tritici] was general around Twin Falls, [Idaho] with more than 5% seen in one field of Dicklow.

Stripe rust [Puccinia glumarum] was widely distributed in the Northwest and probably damaged White Federation most among commercial wheats. Leaf rust [P. rubigo-vera tritici] was moderately severe from Pullman, [Washington] to Sandpoint, [Idaho] and stem rust [P. graminis] did some damage in this same area. Trace amounts of all three rusts were seen in Utah.

There was much ergot [Claviceps purpurea] in rye in northern Idaho. (DIVISION OF CEREAL CROPS AND DISEASES. AUG. 4, 1942).

REPORTS ON SOYBEAN DISEASES

AN UNDETERMINED, APPARENTLY VIRUS, DISEASE OF EDIBLE SOYBEANS IN RHODE ISLAND: Twenty-four varieties of edible soybeans are being grown in randomized, replicated rows by Mr. Russell E. Larson, olericulturist, at the Rhode Island State Agricultural Experiment Station farm. On August 26 none of the reported bacterial or fungous diseases were found in the plot. However, an outstanding "crinkle" or "rugose" symptom was present. A virus disease is indicated but similar symptoms have not been described on soybean in the literature available. A variety trial of garden peas grew in the adjoining plot earlier in the season and viruses are likely to have been transmitted. While slight symptoms, of the mosaic type Marmor (F. O. Holmes, Handbook of Phytopathogenic Viruses), were present in most of the varieties, the chief symptom complex would place the disease in the generic group, Savoia, and in which Soja max Piper is not listed as a suscept. The relative varietal susceptibility is indicated by the disease index (0-1-2-3-4 from none to very severe) figures as follows:

	Early Varieties			Late Varieties	
1.	Giant Green	1.0	1.	Sousei	1.0
2.	Sae	1.0	2.	Fuji	1.3
3.	Etum	2.0	3.	Toku	1.7
4.	Goku	2.0	4.	Hakote	1.7
5.	Tastee	2.3	5.	Emperor	1.7
6.	Kanum	2.3	6.	Hokkaido	2.0
7.	Yellow Marvel	2.7	7.	Togun	2.0
8.	Kanro	2.7	8.	Osaya	2.0
9.	Bansei	3.0	9.	Willami	2.7
10.	Chusei	3.0	10.	Imperial	3.0
11.	Waseda	3.7			

(Frank L. Howard. Rhode Island State College. September 3).

[1/ Fischer, George W. Infection of forage grasses with flag smuts of wheat, rye, and grasses (Urocystis tritici, U. occulta, and U. agropyri, respectively). Abst. Phytopath. 32: 4-5. 1942.

" . . . Urocystis tritici and U. agropyri are practically iden-

TOBACCO RING-SPOT ON EDIBLE SOYBEANS IN INDIANA IN 1941: A high percentage of the plants in a trial planting of vegetable soybeans, near Whiteland, Johnson County, were infected with tobacco ring-spot [virus] in 1941. (R. W. Samson, Purdue University Agricultural Experiment Station).

MORE ABOUT SOYBEAN DISEASES FROM VIRGINIA: I should like to second the request made in the August 15 Reporter for more information on the identity and prevalence of soybean diseases. Every year I see field after field of diseased soybeans affected with bacterial leaf and pod spot, Fusarium wilt, stem rot, root knot, mosaic and what appears to be a nutritional deficiency.

Very little information on the control of soybean diseases is available, and this is also true of the diseases of other forage crops. More research work is badly needed on the diseases of these crops so that farmers may be enabled to employ effective and practical measures for their control. (S. B. Fenne, Extension Plant Pathologist).

SOYBEAN DISEASES IN WESTERN NORTH DAKOTA: In local gardens the edible variety Sioux is subject to bacterial blight ("rust") (Bacterium [Phytomonas] phaseoli), apparently the same form which was so very destructive on snap beans this year. In order to obtain yields of green shell beans from soybean, early seeding is employed and bacterial blight as well as damping-off are serious factors in obtaining stands, particularly when cold wet weather prevails, as it did this year. Fusarium scirpi var. acuminatum and Pythium debaryanum were frequent isolates from garden and field soybeans at Mandan and McCanna, North Dakota, but did not appear to be doing much damage other than adding to pre-emergence injury at Mandan. Field soybeans seeded June 1 at McCanna appeared very healthy on August 12, but obviously would never mature seed. Much needs to be learned about seedling troubles and their effect on time-of-seeding for this area. (Roderick Sprague, Division of Cereal Crops and Diseases. Northern Great Plains Field Station, Mandan, North Dakota. August 20).

TWO NEW RECORDS FOR THE FROG-EYE LEAF SPOT: Specimens of Cercospora diazu Miura have been received from Maryland and Virginia. The disease has not been recorded previously from either State.

Maryland: Affected plants, probably of the Virginia variety, were sent in by the County Agent of Carroll County during August. The disease was said to be severe in the field in which it occurred. (M. W. Woods, University of Maryland College of Agriculture).

[1/ continued from page 381.
tical in their morphology, and it is recommended that they be considered as races of the same species, which, by priority, would bear the name U. agropyri. . . The demonstrated susceptibility of grasses to flag smut of wheat and the morphological identity of this smut with the similar flag smut on grasses suggests a possible explanation of the source of outbreaks of wheat flag smut in the U. S. where flag smut of grasses has long been known from coast to coast on a wide variety of grass species."]

Virginia: I am enclosing a specimen of soybean leaves sent in from Stafford County, near Fredericksburg. The county agent, W. L. Browning, reports that this is a sample of the foliage of a 50-acre field. About 25% of the pods on these plants have dried up. This is the first time I have observed *Cercospora* on soybeans in Virginia. It very probably has occurred previously but escaped our attention. (S. B. Fenne, Extension Plant Pathologist. September 2).

LATE BLIGHT AND OTHER DISEASES OF POTATOES AND TOMATOES

LATE BLIGHT OF POTATOES IN MARYLAND: Late blight is unusually severe in Garrett County, Maryland, this year. It was first observed late in June and has been increasing in severity ever since that time. When I visited the County during the week of August 24, I found that all potato vines were dead in unsprayed and poorly sprayed fields even where resistant varieties like Sequoia and Sebago were planted. Some blight was present in practically every field in the County and the most thoroughly sprayed fields were free from severe injury. Much tuber rot has been reported in fields which have already been dug and it is estimated that the total loss in the County from combined vine and tuber infection will amount to approximately 40 to 50% of the crop.

In an unsprayed experimental plot several varieties and seedlings were replicated 8 times and the amount of tuber rot was computed by weight in each replication. The average amount of tuber rot by weight in some of the varieties and seedlings was as follows: Pioneer Smooth Rural 0.2%, Sebago 0.1%, Sequoia 5.1%, Seedling B247 0.2%, Seedling 672-5 0.3%, and Seedling 47345 1.3%. (R. A. Jehle, University of Maryland. September 3).

LATE BLIGHT IN SOUTHWEST VIRGINIA: Late blight (*Phytophthora infestans*) increased very rapidly in Southwest Virginia during August and caused severe damage to late maturing potatoes. It was exceedingly wet during most of August and conditions were ideal for late blight. In many cases the potato vines were completely blighted and dead 2 weeks before their normal maturity. Considerable tuber rot was observed. The leaves and fruits of tomatoes on the experiment station plots at Blacksburg were also affected by the disease. (S. B. Fenne, Extension Plant Pathologist).

LATE BLIGHT IN THE GAINESVILLE SECTION OF FLORIDA: Late blight was previously, that is before this year, not common in gardens in this region. In May and June of 1942 a heavy attack was killing plants and infecting tubers, causing rot, in gardens in Gainesville. (George F.Weber, Florida Agricultural Experiment Station).

POTATO LATE BLIGHT IN OHIO: Late blight of potatoes is present in the early potato crop and more widely spread in the State than ordinarily. Unsprayed fields in the northern part were damaged by late blight. It is appearing in the late potato crop. (C. C. Allison, Extension Plant Pathologist. August 25).

POTATO DISEASES IN WESTERN NORTH DAKOTA: No late blight has been seen on the station yet, although we have had an odorous soft rot of potatoes which is not usually common here. Early blight [Alternaria solani] is prevalent. The potatoes in this area are not in general as good as expected considering the abundant moisture this season. (Roderick Sprague, Division of Cereal Crops and Diseases. Northern Great Plains Field Station, Mandan, North Dakota. August 20).

TOMATO FRUIT ROT AND EARLY BLIGHT IN PENNSYLVANIA: The excessive rain is causing much rotting of tomatoes. They will not ripen to meet U. S. No. 1 grade. One big cannery below Harrisburg has not had any tomatoes yet that can be used for juice. All of the tomatoes are being used for puree. Alternaria [solani] has caused excessive defoliation and in one field anthracnose [Colletotrichum phomoides] was causing damage. (George L. Zundel, Pennsylvania State College. August 22).

TOMATO LEAF SPOTS DESTRUCTIVE IN OHIO: Leaf spots of tomatoes - Septoria [lycopersici] and Alternaria [solani] - are very destructive in the tomato canning section of northwestern Ohio. The plants developed rapidly with abundant foliage, but in many fields nearly all the foliage has been killed by one of these organisms. In tomato fields adequately dusted, or sprayed, the plants have retained most of their foliage. (C. C. Allison, Extension Plant Pathologist. August 25).

NEGATIVE REPORT ON TOMATO TIP BLIGHT: No tomato tip blight [virus] was seen in Minnesota, North Dakota, South Dakota, or Nebraska in the occasional tomato fields examined en route. (G. H. Godfrey, Texas Agricultural Experiment Station. August 19).

BRIEF NOTES ON PLANT DISEASES

FIRE BLIGHT ON PEARS IN FLORIDA: In the vicinity of Gainesville last year, more blight (Bacillus amylovorus) [= Erwinia] appeared than during any year for a decade. The disease was spectacular. This year (1942) has been a repeater for the disease, being very similar to last year. (George F. Weber, Florida Agricultural Experiment Station).

TETRACHLORO-PARA-BENZOQUINONE A GROWTH STIMULANT: George L. McNew reports that Spergon, a commercial product of this compound, acted as a growth stimulant as well as a seed protectant, in experiments with peas. The material was tested in both infested and in steam soil, in comparison with other fungicides. When planted in steam soil, seed treated with Spergon consistently produced larger plants than seed treated with the other materials. It is not known how many kinds of plants will give the same response to treatment with this compound as peas. There is some evidence, but no proof yet, that Lima beans and sweet potatoes may be stimulated. McNew stresses the practical application of this property thus, ". . . Like any other good seed protectant it can increase the yield under severe disease conditions by preventing seed destruction. In addition, it can stimulate plant growth even in the absence of disease. From a practical view-point this is tremendously important. Heretofore, seed treatment has been recommended as a form of crop insurance against disease because it is needed in one of every three or four fields. As a growth stimulant, the material should pay dividends in practically every field, irrespective of disease conditions. . ." (McNew, George L. Growth stimulation of peas by tetrachloro-para-benzoquinone, a fungicidal seed protectant. Science n. s. 96: 118-119. July 31, 1942).

"KURUME YELLOWS" is a plant disease with an important role in Rex Stout's detective novel "Black Orchids".

A CORRECTION: On page 14 of Earle C. Blodgett's report on fruit diseases in Idaho in 1941, in the January 15 issue this year, 4 (a) should read as follows "The diagnosis of the trouble on suspicious trees near Weiser is not certain but <u>symptoms are</u> similar to those of pink fruit." The underlined words were omitted.

CHECK LIST REVISION

Freeman Weiss

<u>SOPHORA</u> (LEGUMINOSAE)

SOPHORA JAPONICA L., JAPANESE PAGODA-TREE. Deciduous tree of E. Asia, grown for ornament and sometimes street planting, Zone IV.

Cytospora sophorae Bres., on twigs. N. H., N. J., N. Y.
Diplodia sophorae Speg. & Sacc., dieback. Ohio.
Microsphaera alni DC. ex Wint., powdery mildew. Conn.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Nectria cinnabarina Tode ex Fr., twig blight. Conn., N. Y.
Rhizoctonia solani Kühn, damping off. Conn.

SOPHORA SECUNDIFLORA (Cav.) DC., FRIJOLITO, MESCALBEAN. Evergreen shrub or small tree of Growth Regions 11, 16, 17, 20, 30.

Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
Phyllosticta sophorae Ell. & Ev., leaf spot. Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

SOPHORA SERICEA Nutt., SILKY SOPHORA. Woody herb of the Great Plains.

Uromyces hyalinus Pk., rust (O, I, III). S. Dak. to Texas, Ariz. and Wyo.

SOPHORA VICIIFOLIA Hance, VETCHLEAF SOPHORA. Deciduous shrub of China, grown for ornament, Zone V.

Heterodera marioni (Cornu) Goodey, root knot. Md.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

SORBUS (ROSACEAE)

SORBUS AMERICANA Marsh., AMERICAN MOUNTAIN-ASH. Including S. DECORA (Sarg.) Schneid., SHOWY M. Small tree of Growth Regions 23, 24, 26, 27; furnishes food for wild life and cult. for ornament, Zone II.

Alternaria sp., Leaf spot. Iowa.
Armillaria mellea Vahl ex Fr., root rot. N. J.
Cytospora spp., canker, dieback. Spp. reported include C. chrysosperma Pers. ex Fr., Minn., Mont., Nebr., N. J., Wash.; C. leucostoma Sacc., Mont.; C. massariana Sacc., Idaho; C. microspora (Cda.) Rabh., Mont.; C. rubescens Fr., Nev. See also Eutypella and Valsa.
Dermatea ariae (Pers. ex Fr.) Tul. (Micropera cotoneastri (Fr.) Sacc.), on twigs. Mich., N. Y., Pa.
Diaporthe impulsa (Cke. & Pk.) Sacc., on branches. Mass., Mich., N.H., N
Dothiorella pyrenophora Sacc., on branches. Kans., R. I.
Entomosporium maculatum Lév. var. domesticum Sacc., (? Fabraea maculata Atk.), leaf spot. Wis.
Erwinia amylovora (Burrill) Winslow et al., fire blight. Widespread.
Eutypella sorbi (Schm. & Kze.) Sacc. (Cytospora rubescens Fr.), on branches. Mont.
Excipulina pallida (Pk.) Dearn. & House, on branches. N. Y., Wis.
(Fusicladium dendriticum (Wallr.) Fckl. and var. orbiculatum Sacc.): Venturia inaequalis.
Gloeodes pomigena (Schw.) Colby, on twigs. Ind.
Glomerella cingulata (Ston.) Spauld. & Schrenk, branch canker, fruit rot. Ind.
Graphium sorbi Pk., leaf spot. N. Y., Wis.
Gymnosporangium aurantiacum Chev., rust (O, I). Me. to N. J. & Wis. III on Juniperus communis var. depressa.

SORBUS AMERICANA cont.

Gymnosporangium globosum Farl., rust (O, I). N.E. States. III on Juniperus virginiana.

Nectria cinnabarina Tode ex Fr., N. Car.

Nummularia discreta (Schw.) Tul., blister canker. Iowa, Mass., Minn., W. Va.

N. repanda (Fr.) Nits., on branches. Pa.

Phomopsis sp., twig blight. Mass.

Phyllosticta sorbi Westend., leaf spot. Ill., Me., Mo., Okla.

Physalospora obtusa (Schw.) Cke., black rot, canker. Conn. to Va. & Mich.

Phytomonas tumefaciens (EFS. & Town.) Bergey. Conn., N. J.

Polyporus hirsutus Wulf. ex Fr., white heart rot. Mich., Wash.

P. versicolor L. ex Fr., wound rot. Wis.

Pseudopeziza pyri Pk., on leaves. N. Y.

Ramularia destruens Pk., on leaves. N. Y.

(Sphaeronema pallidum Pk.): Excipulina pallida.

Thyridaria sorbi Dearn. & House, on branches. N. Y.

Valsa spp., on twigs & branches, sometimes causing cankers and dieback. Spp. reported include V. leucostoma Pers. ex Fr., Mont., N. Y.; V. massariana DeNot., Idaho; V. sordida Pers. ex Fr., widespread.

Venturia inaequalis (Cke.) Wint. var. cinerascens (Fckl.) Aderh., scab. Ill., Minn., N. Y., Wash.

Erineum, -- epidermal proliferation caused by mites. Alaska.

SORBUS AUCUPARIA L., EUROPEAN MOUNTAIN-ASH. Small tree of Europe and W. Asia, occurring in several botanical vars., cult. for ornament, Zone II, and locally naturalized in the Eastern and Central States.

Cytospora rubescens Fr., trunk canker. Iowa. Conidial stage of Eutypella sorbi.

Entomosporium maculatum Lév., var. cydoniae Sacc., leaf spot. Wis.

Erwinia amylovora (Burr.) Winslow et al., fire blight. N. Y.

Gymnosporangium aurantiacum Chev., rust (O, I). Conn., Mich., N. J.

G. libocedri (P. Henn.) Kern, rust (O,I). Oregon. III on Libocedrus decurrens.

Nummularia discreta (Schw.) Tul., blister canker. Iowa.

Phyllosticta sorbi Westend., leaf spot. Iowa.

Physalospora obtusa (Schw.) Cke., trunk canker. Ind., Ohio.

Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Conn., N. J.

Podosphaera oxyacanthae DC. ex DBy. var. tridactyla Wallr., powdery mildew. Wash.

Septoria sorbi Lasch, leaf spot. Iowa.

Valsa leucostoma Pers. ex Fr., twig blight, canker. Ohio, W. Va.

Venturia inaequalis (Cke.) Wint., scab. Ill.

SORBUS SITCHENSIS Roem., PACIFIC MOUNTAIN-ASH. Including S. OCCIDENTALIS (Wats.) Greene, WESTERN M. Shrubs or small trees of Growth Regions 4 & 12, and sometimes planted for ornament.

Coryneum sorbi Pk., on twigs. Calif.
Cytospora chrysosperma Pers. ex Fr., canker, dieback. Colo., Mont., Nebr.
Diaporthe impulsa (Cke. & Pk.) Sacc., on branches. Calif.
Dothiorella scopulina Dearn. & Barth., on branches. Wyo.
Eutypella sorbi (Schm. & Kze.) Sacc. (Cytospora rubescens Fr.), on branches. Colo., Mont.
Fabraea maculata Atk., leaf blight. Alaska.
Gymnosporangium aurantiacum Chev., rust (O, I). Mont. to Colo., Wash. & Alaska.
G. juniperinum (L.) Mart., rust (O, I). Mont. to Colo., Wash. & Alaska. III on Juniperus communis var. depressa.
G. nelsoni Arth., rust (O, I). Mont., Wash., Wyo. III on Juniperus spp.
G. nootkatense (Trel.) Arth., rust (O, I). Oregon, Wash., Alaska. III on Chamaecyparis nootkatensis.
Nectria cinnabarina Tode ex Fr., twig blight. Alaska.
Phyllosticta globigera Sacc., leaf spot. Idaho, Wash.
Rhabdospora inaequalis Sacc., on twigs. Alaska.
Septoria sitchensis Dearn., leaf spot. Idaho.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

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IN THIS ISSUE

HETERODERA ROSTOCHIENSIS, THE GOLDEN NEMATODE OF POTATOES, IN NEW YORK STATE

B.G. Chitwood, U.S. Dept. Agriculture; R.L.Clement, R. Morgan, and R.Tank, N.Y. State Dept. Agriculture and Markets

In 1941 Cannon (Nassau County Farm and Home Bureau News v. 27(8): 3) reported on the occurrence of the potato nematode, Heterodera rostochiensis Wollenweber 1923, in New York, basing his report on identifications made by the senior author. At that time 2 adjoining fields, consisting of approximately 110 acres, were known to be infested. Since this is the first reported occurrence of H. rostochiensis in the United States, it is of considerable interest. Inasmuch as the potato is attacked by at least 4 different important nematode pests, namely the root-knot nematode, Heterodera marioni (Cornu 1879) Goodey 1932, the bulb or stem nematode, Ditylenchus dipsaci (Kühn 1857) Filipjev 1936, the meadow nematode, Pratylenchus pratensis (de Man 1880) Filipjev 1936, and the present form, i.e. H. rostochiensis, it is proposed to name the latter the golden nematode of potatoes to supply a convenient term for the layman. The name is based on the golden appearance of the female nematode as it is seen by the naked eye on the roots and tubers during a phase of its development.

During the current season a survey of certain potato fields was conducted by the New York Department of Agriculture and Markets in cooperation with the Bureau of Plant Industry of the United States Department of Agriculture. The survey covered a block in Nassau County, Long Island, containing a total of 4841 acres of potato land and representing 147 individual fields. The golden nematode of potatoes was found in 419 acres, representing 14 fields. All of these fields were in close approximation to one another, the entire infested area being only 1 1/2 miles long and 1 mile wide. The first field in which this nematode was found in 1941 is centrally located in the area and appears to have been the locus of infestation for the area. Presumably the nematode was introduced into this field on diseased seed potatoes 10 to 14 years ago. After 4 to 8 years the soil infestation had been built up to such an extent that there was noticeable injury to the crop. Since its original introduction the disease has spread from field to field by the potato digger, plowing, flooding, and possibly by wind storms. The outside source from which the disease was introduced remains undetermined.

Heterodera rostochiensis apparently requires several years in which to build up a population sufficient to cause crop damage. Its first field symptoms are noticed as spots or strips in which the potato vines do not make a strong growth and weeds predominate. Examination of the roots of potato plants in the latter part of June and early in July discloses the presence of small white to golden spherical glistening bodies about the size of a pinhead, attached to the roots and sometimes to the tubers. These are the females of the golden nematode of potatoes, H. rostochiensis. Apparently this nematode does not cause disfiguration of the tubers nor does it cause knotted roots as does H. marioni. The injury which it produces takes the form of stunted vines and reduction in size of tubers. In 1941 Cannon found a 30% reduction in the yield of variety Irish Cobbler and a

70% reduction in the yield of variety Warba due to the golden nematode of potatoes. In 1942, the writers found a 70% reduction in the yield of Green Mountain potatoes due to it. Actually the financial loss is considerably greater than is indicated by such figures since most of the potatoes grade Number 2 or 3 and few Number 1's are produced.

Late in the season (last week in July and first part of August) the female nematodes turn brown and tend to drop off the roots and tubers. At this time field inspection is difficult. However, soil flotations may be made at any time of year to ascertain the presence of the nematodes. The brown cysts (females) float to the surface when soil is mixed with water. The finding of brown cysts is not in itself a diagnosis for H. rostochiensis since another species of the genus, Heterodera schachtii Schmidt 1871, is sometimes present in the soil. Cysts of the latter form tend to be lemon-shaped rather than spherical; its natural host in this region is Polygonum pensylvanicum L., or Pennsylvania smartweed. This weed is common in potato fields as well as other cultivated lands of Nassau and Suffolk Counties. H. schachtii has been found on smartweed in various parts of Nassau County and in the vicinity of Easthampton, Suffolk County. The distribution is not related to the distribution of H. rostochiensis.

At the present time Heterodera rostochiensis appears to be spread within fields and from field to field by the following means: (1) mechanical, - use of the potato digger, plowing and cultivating; (2) drainage, - since the nematode cysts float they naturally spread in the direction of water flow; (3) wind, - dust storms are common in the area; (4) use of soiled bags. The danger of use of bags in clean fields following their use for picking up potatoes in infested fields is ever present. Thus far there is no evidence of spread by the planting of seed potatoes from infested fields since the original introduction of the nematode many years ago. Natural barriers in the form of hedge rows and waste land have been very important in the confinement of the disease to its present area.

The following recommendations have been made for the isolation and confinement of the golden nematode of potatoes to its present distribution: (1) Avoid hauling soil from field to field; clean all implements following use on infested land; do not turn on neighboring fields; do not use soiled bags for picking up potatoes from clean fields. (2) Cultivate and plant parallel to known strips of infestation. (3) Plant at right angles to direction of drainage when not contraindicated by direction of infested strips. (4) Do not use potatoes from infested fields for seed purposes. (5) Plant barrier crops on the periphery of known infestations. These include corn, oats, string beans, cabbage, rape, and mustard.

RECENTLY ACTIVE LEAF DISEASES OF WOODY PLANTS IN IDAHO

John Ehrlich

Abnormally high rainfall in Idaho during the late summer of 1941 and the late spring and early summer of 1942 is assumed to have favored natural inoculation for a number of fungi. At any rate, several fungous diseases of the leaves of woody plants became sufficiently active in 1941 and 1942

to result in widespread notice of their symptoms. Some new or noteworthy cases are reported herewith.

Western Larch (Larix occidentalis Nutt.)

Needle blight or leaf cast. -- A severe early-season browning of larch foliage (distinct from the more enphytotic disease caused by Hypodermella laricis Tub.) has been conspicuous for the past 2 seasons on trees of all ages in the majority of the larch stands of northern Idaho. The disease was also observed in central Washington east of the Cascade Crest along U. S. Highway 410 between American River and Chinook Pass. A considerable amount of reproduction has already been killed and any further yearly outbreaks of like severity will doubtless cause retardation of growth and some mortality in older trees.

Every specimen examined microscopically proved to bear the inconspicuous fruiting structures of Meria laricis Vuill. 1/, which is widespread and injurious on the continent of Europe and in Great Britain on the native L. decidua Mill. and also occurs in British plantings of L. occidentalis 2/. The fungus does not appear to have been recognized heretofore in North America but is now doubtless firmly established in the Pacific Northwest.

Needle rusts. -- At least a part of the early-season browning of larch foliage in northern Idaho was caused by needle rusts which were more abundant than usual (according to observations by A. W. Slipp). Of these, Melampsora bigelowii Thuem. was certainly active, and possibly also M. medusae Thuem. and M. occidentalis Jacks. Later in the season, aecial and telial stages were abundant on several species of Salix, and on Populus tremuloides Michx. var. aurea (Tidestr.) Daniels, P. hastata Dode, and P. balsamifera L.

Lodgepole Pine (Pinus contorta Loud. var. latifolia Engelm.)

Needle blight or leaf cast. -- A less conspicuous browning and casting of one-year-old needles on lower branches of lodgepole pine has been observed for at least 4 years in Idaho County and in the last 2 years has become more widespread and injurious. Although Hypodermella concolor (Dearn.) Darker and Elytroderma deformans (Weir) Darker occur on many of the affected trees, the most common associate of necrosis is an apparently undescribed species of Hendersonia. Sustained infection reduced needle retention from the normal span of 5-8 years to but a single year, with consequent lowering of tree vigor, accelerated loss of lower branches, and death of young trees.

Western Redcedar (Thuja plicata D. Don)

Leaf blight. -- In addition to Didymascella thujina (Durand) Maire and 2 or more species of Coryneum, Chloroscypha seaveri (Rehm) Seaver 3/ has

1/ Identification confirmed by Miss E. K. Cash.
2/ Vide Peace, T. R., and C. H. Holmes. Oxford Forestry Memoirs No.15;1933.
3/ Several collections by A. W. Slipp were identified by Dr. Fred J. Seaver.

been found repeatedly associated with death of western redcedar twigs in various parts of northern Idaho. The latter fungus has been reported heretofore apparently only from the type locality in adjoining western Montana.

Golden Aspen (Populus tremuloides Michx. var. aurea (Tidestr.) Daniels)

Shoot blight. -- Early in the 1942 growing season Fusicladium radiosum (Lib.) Lind 4/ (= Napicladium tremulae (Frank) Sacc., the conidial stage of Didymosphaeria populina Vuill.) was conspicuously aggressive in the leaves and twigs of golden aspen throughout northern Idaho and sporulated luxiantly on the moister sites.

Ink spot. -- Sclerotium bifrons Whetzel (the imperfect stage of Sclerotinia bifrons Seaver & Shope) was unusually abundant during the past summer on aspen in central and southern Idaho (according to observations by R. K. Pierson and P. Proctor, Jr.).

Leaf rust. -- The uredial and telial stages of Melampsora albertensis Arth. developed so intensely during 1941, especially in central Idaho, that aspen foliage turned yellow and dried by mid-summer. This species and possibly also M. medusae Thuem. were also unusually abundant in northern Idaho during 1942.

American Sycamore (Platanus occidentalis L.)

Anthracnose and twig blight. -- Numerous specimens and inquiries from communities in southwestern Idaho indicated that Gloeosporium nervisequum (Fckl.) Sacc. (the imperfect stage of Gnomonia veneta (Sacc. & Speg.) Kleb.) was unusually injurious on shade trees during the early summer of 1942.

Sitka Alder (Alnus sinuata (Regel) Rydb.)

Leaf spot. -- Septoria alnifolia Ell. & Ev. 5/ was abundant during early summer 1942 on Sitka alder in the Salmon River Valley below Salmon City in central Idaho (according to specimens received, and observations by P. Proctor, Jr.). The fungus has not apparently been reported previously in Idaho.

Sticky Currant (Ribes viscosissimum Pursh)

Leaf spot. -- A severe spotting of the leaves of sticky currant has been common on shaded sites in northern Idaho during the past 2 seasons. The associated fungus is close, but apparently not identical, to Cylindrosporium ribis Davis 6/, which in turn may be conspecific with Septoria sibirica Thuem. 7/.

(SCHOOL OF FORESTRY, UNIVERSITY OF IDAHO.)

4/ Identification confirmed by Miss E. K. Cash.
5/ Identification confirmed by Miss E. K. Cash.
6/ Authentic specimens examined through courtesy of Dr. H. C. Greene.
7/ No authentic specimens examined. Vide Davis in Trans. Wisc. Acad. Sci. 19: 673. 1919.

BARLEY SCAB AND BLIGHT PRESENT IN LOCAL AREAS IN THE 1942 CROP

James G. Dickson

Blight-damaged barley occurs in local sections throughout the spring-barley area. The damage extends westward into Kansas, Nebraska, and the Dakotas. Reports from various states, limited field surveys, and samples from car lots received from the terminal markets indicate local blight areas ranging from light to severe infections. Receipts of barley inspected at central-western markets during the period of August 1-15 indicated blight was more severe than in 1941. Seven percent graded blighted, compared with 1% for the same period last year. Samples from 22 car lots have been received for plating during the first half of August. Twenty of these have over 4% blight damage. Blight damage appears to be more severe through Iowa and Minnesota and westward.

Table 1. -- Preliminary data of percentage distribution of the 4 principal organisms isolated from blighted barley kernels from the 1942 crops.

Location	Organisms isolated			
	Gibberella saubinetii	_Fusarium_ spp.	_Helminthosporium sativum_	_Alternaria_ spp.
Northern Iowa	43	29	14	14
Southern Minnesota	50	11	19	20
Northern Minnesota	3	37	12	48
Southern Wisconsin[a]	18	3	52	27
Northern Wisconsin[a]	0	56	22	22
South Dakota	9	5	62	24
Nebraska	3	15	55	27
Kansas	14	0	14	71

a/ Isolations from head samples obtained in disease surveys, no car-lot samples included.

The preliminary platings from survey and car-lot samples indicate _Gibberella saubinetii_ (Mont.) Sacc. [_G. zeae_], _Fusarium_ spp., _Helminthosporium sativum_ P. K. and B., and _Alternaria_ spp. the predominating organisms as shown in Table 1. _Gibberella_ is confined largely to the Corn Belt section of the spring-barley area. _Helminthosporium_ as usual predominates in the more western area and is high in southern Wisconsin based on head samples only. The rather high percentage of _Fusarium_ spp., mostly of the Sporotrichiella group, is somewhat unusual.

(COOPERATION BETWEEN THE DIVISION OF CEREAL CROPS AND DISEASES AND THE WISCONSIN AGRICULTURAL EXPERIMENT STATION.)

BRIEF NOTES ON PLANT DISEASES

POTATO LATE BLIGHT RECORDED IN ANOTHER STATE: FIRST REPORT FOR NEBRASKA: Late blight (*Phytophthora infestans*) was observed in the early potato region of central Nebraska this year. This is the first recorded appearance of the disease in the State. Severe leaf defoliation occurred in the vicinity of Comstock and Burwell in the Loup River Valley. No definite tuber infection could be found and isolations from questionable discolored areas on the tuber did not yield the late-blight organism. However, some tuber infection occurred in the early potato region between Kearney and Grand Island.

Prior to the first of July the weather conditions were very favorable for the development of blight in these regions. Above normal rainfall and cool temperatures (below normal) prevailed throughout most of the growing season. (J. E. Livingston and M. W. Felton, Department of Plant Pathology, Nebraska Agricultural Experiment Station, Lincoln).

[NOTE: First authenticated reports from other States in recent years are Kansas, 1935, reported by C. H. Elmer, PDR Suppl. 96:228. 1936; Colorado, 1941, reported by W. A. Kreutzer and John G. McLean, PDR 26:91. Mar. 1, 1942; North Dakota, 1942, reported by G. H. Godfrey, PDR 26:372. Sept. 1, 1942.]

A NEW INTRODUCTION OF TOBACCO BLACK SHANK INTO KENTUCKY: On August 18, 1942, County Agent G. H. Karnes of Marion County, Kentucky, brought Burley tobacco plants affected with black shank [*Phytophthora parasitica* var. *nicotianae*] to the laboratory. These plants came from one corner of a field about 2 miles northwest of Lebanon. Mr. Karnes reported the following observation which was later confirmed by a visit to this farm by the writers. The grower hauls, by truck, fruits and vegetables, and tomato, cabbage, and sweetpotato plants, from Florida and Georgia. The garage where the automobile truck is stored is adjacent to the corner of the field where black shank first appeared. Mr. Karnes surmised that, after unloading, the truck was backed into the field adjacent to the garage and swept free of soil and plant debris. The grower stated that this had occurred at least once after hauling plants from the South. This appears to be a case of transporting a serious plant disease, either on soil or plant debris, to a region previously free of the disease, because this is the first and only known occurrence of black shank in Marion County. This makes the seventh area where the disease has appeared in the State. All are rather widely separated.

Drainage from this farm traverses Marion, Washington, Nelson, and Bullitt Counties before emptying into the Ohio River south of Louisville. Much tobacco is grown in the river and creek bottoms of these 4 counties and might be menaced by black shank from the infested area in Marion County. (E. M. Johnson and W. D. Valleau, Kentucky Agricultural Experiment Station).

SMALL GRAIN DISEASES IN SOUTH DAKOTA: Leaf rust [Puccinia rubigo-vera tritici] was the principal cause of disappointing yields of Thatcher wheat in the eastern half of South Dakota in 1942.

Around Brookings the scab fungus [Gibberella zeae] infected fully 50% of the kernels, usually the entire heads up to 30% or more of the crop. I can't remember ever having seen anything like it before.

Stem rust [P. graminis] damage was practically nil in South Dakota in 1942. That was the only bright aspect of the small grain disease picture in the eastern half of the State. Despite the absence of stem rust, the barley crop was perhaps the biggest disappointment. Helminthosporium [sativum] spot blotch and bacterial blade blight [Phytomonas translucens] had defoliated all commercial barley by July 4. Root rot was prevalent and the final crop, in the face of outstanding prospects earlier, was scarcely a third of what it might have been. Wheat, oats, and rye were also only half a crop in the eastern third of the State. (W. F. Buchholtz, South Dakota Agricultural Experiment Station, Brookings. September 9).

SPOTTING OF CHERRY FRUITS CAUSED BY THE LEAF-SPOT FUNGUS: F. A. Hodges of the Microanalytical Division, Food and Drug Administration, found the Cylindrosporium stage, C. hiemalis, on sour cherries from the Sturgeon Bay area, Wisconsin, in July. The value of the fruit for canning was affected by the spotting. According to J. W. Roberts of the Bureau of Plant Industry, there are only occasional references to fruit infection by this fungus. He considers its occurrence on the fruit rather uncommon although he has found it on cherry fruits of the Morello variety.

CHECK LIST REVISION

Freeman Weiss

SPARTIUM (LEGUMINOSAE)

SPARTIUM JUNCEUM L., WEAVERSBROOM. Shrub of Mediterranean region; cult. for ornament, Zone VII, especially Calif.

Diplodia sarothamni Cke. & Hark., on twigs. Calif.
Pestalotia polychaetia Cke. & Harkn., on twigs. Calif.
Phoma sarothamni Sacc., on twigs. Calif. (A synonym of Phomopsis s. (Sacc.) Höhn., conidial stage of Diaporthe s. (Auer.) Nits., which is not reported from the U. S.)

SPIRAEA (ROSACEAE)

SPIRAEA spp., (1) exotic flowering shrubs, mostly Oriental, commonly cult. for ornament, as S. CANTONIENSIS Lour., S. CHAMAEDRYFOLIA L., S. JAPONICA L. f., S. PRUNIFOLIA Sieb. & Zucc., S. THUNBERGII Sieb., S. TRILOBATA L.; also hybrids as S. BUMALDA, S. VANHOUTTEI and others; mostly hardy in Zone IV.

SPIRAEA spp. cont.

Cylindrosporium filipendulae Thüm., leaf spot. Iowa.
Diaporthe viburni Dearn. & Bisby var. spiraeicola Wehmeyer, on twigs. N. Y.
Diplodia spiraeicola Ell. & Ev., on twigs. N. Y.
Erwinia amylovora (Burr.) Winslow et al., fire blight. Md., N. J., N. Car., Va.
Heterodera marioni (Cornu) Goodey, root knot. Fla., Miss.
Heterosporium spiraeae Syd., on leaves. Alaska.
Microsphaera alni DC. ex Wint., powdery mildew. Conn.
Mycosphaerella sp., on leaves. Alaska.
Phomopsis spiraeae (Desm.) Grove, on twigs. Md.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Texas.
Physalospora obtusa (Schw.) Cke., on twigs. Ga.
Phytomonas rhizogenes Riker et al., hairy root. Iowa.
Podosphaera oxyacanthae DC. ex DBy., powdery mildew. Widespread.

SPIRAEA spp., (2) native shrubs, as S. ALBA Du Roi, and S. LATIFOLIA (Ait.) Borkh., MEADOWSWEET, S. SALICIFOLIA L., WILLOWLEAF SPIRAEA (introduced from Europe and escaped), and S. TOMENTOSA L., HARDHACK, occurring in the Eastern and Central States; and S. DOUGLASII Hook., and S. MENZIESII Hook., of the Pacific Coast States; sometimes grown for ornament and hybridizing with other ornamental forms.

Ascochyta salicifoliae Trel. See Phleospora.
Belonidium spiraeae Dearn. & House, on dead twigs. N. Y.
Cercospora rubigo Cke. & Harkn., leaf spot. Calif., Kans., Oregon, Wis.
Cryptodiaporthe macounii (Dearn.) Wehmeyer, on twigs, ? canker. N. Y.
Cylindrosporium spp., leaf spot. Spp. reported include C. fairmanianum Sacc., N. Y.; C. salicifoliae (Trel.) Davis = Phleospora s.; C. spiraeicolum Ell. & Ev., Idaho.
Diaporthe viburni Dearn. & Bisby var. spiraeicola Wehmeyer, on twigs. Mass.
Gnomonia papillostoma Dearn. & House, on leaves. N. Y.
Phleospora salicifoliae (Trel.) Petr., leaf spot. N. Y. to Kans. and Wash. (Reported under various names as Ascochyta s. Trel., Cylindrosporium s. (Trel.) Davis, Septoria s. (Trel.) Ell. & Ev.; the last name has been generally used in the U. S.)
Physalospora obtusa (Schw.) Cke., on twigs. N. Y.
Podosphaera oxyacanthae DC. ex DBy., powdery mildew. Widespread.
  P. o. var. tridactyla (Wallr.) Salm. Wash.
Ramularia spiraeae Pk., on leaves. N. Y.
Septoria salicifoliae (Trel.) Berl. & Vogl. See Phleospora.
Sphaerotheca castagnei Lév., powdery mildew. Pa.
  S. humuli DC. ex Burr. Conn., Mich., N. Y., Pa.
Sporodesmium spiraeicolum Cke., on leaves. S. Car.
Thelephora terrestris Ehr. ex Fr., stem girdle of seedlings. Idaho.

SPONDIAS (ANACARDIACEAE)

SPONDIAS MOMBIN L., YELLOW MOMBIN. Tree of tropical America grown for edible fruit and ornament in S. Fla., C. America and West Indies.

Cerotelium alienum (Syd. & Butl.) Arth., rust (II, III). P. R.
Heterodera marioni (Cornu) Goodey, root knot. Fla.
Meliola comocladiae F. L. Stevens, black mildew. P. R.

STACHYTARPHETA (VERBENACEAE)

STACHYTARPHETA spp. Shrubs and herbs of tropical America sometimes grown for ornament.

Endophyllum stachytarphetae (P. Henn.) Whetzel & Olive, rust (III). On S. cajennensis Vahl, P. R.
Heterodera marioni (Cornu) Goodey, root knot. On S. dichotoma Vahl, T. H.
Irenina glabroides F. L. Stevens, black mildew. P. R.
Puccinia urbaniana P. Henn., rust (III). Virgin Is.

STAPHYLEA (STAPHYLEACEAE)

STAPHYLEA TRIFOLIA L., AMERICAN BLADDERNUT. Shrub or small tree of Growth Regions 22, 23, 24, 25, 26, 27, 28, 29; grown for ornament, Zone III. Several spp. of European and Oriental origin are more common in cult., but the available records pertain to this sp.

Coryneum microstictum Berk. & Br. var. staphyleae W. H. Davis, twig blight. Mass.
Diaporthe staphylina Ell. & Ev., on branches. Mich.
Eutypella fraxinicola (Cke. & Pk.) Sacc., on branches. Ga.
E. staphyleae Dearn. & House. N. Y.
Gloeodes pomigena (Schw.) Colby, on branches. Ind.
Hendersonia staphyleae Ell. & Ev., on twigs. Pa.
Hypomyces ipomoeae (Hals.) Wr., twig blight. Mass.
Hysterium staphylina (Pk.) Dearn. & House, on twigs. N. Y.
Leptosphaeria rubrotincta Ell. & Ev., on branches. Pa.
Metasphaeria staphyleae Dearn. & House and M. staphylina (Pk.) Sacc., on branches. N. Y.
Mycosphaerella staphylina (Ell. & Ev.) J. H. Miller, leaf spot. Ga., Kans.
Nectria atrofusca (Schw.) Ell. & Ev., on dead branches. Ga., Md., Pa., Va.
Ovularia isarioides (Ell. & Ev.) Sacc., leaf spot. N. Y. to Mo. and Iowa.
Phyllosticta staphyleae Dearn., on capsules. N. Y.
Septoria cirrhosa Wint., leaf spot. Mo.
Sphaeropsis staphyleae Brun., on dead twigs. N. J., N. Y.

STIGMAPHYLLUM (MALPIGHIACEAE)

STIGMAPHYLLUM spp. Woody vines of tropical America, sometimes grown for ornament.

Morenoella decalvans (Pat.) Theiss. var. stigmatophylli Ryan, black mildew. P. R.
Phyllachora inconspicua Chardon, on leaves. P. R.
Puccinia inflata Arth., rust (O, II, III). P. R., Virgin Is.

STRANVAESIA (ROSACEAE)

STRANVAESIA DAVIDIANA Dcne., CHINESE STRANVAESIA. Large evergreen shrub of China, cult. for ornament, Zone VII.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Erwinia amylovora (Burr.) Winslow et al., fire blight. N. J.

STYRAX (STYRACACEAE)

STYRAX AMERICANA L., AMERICAN SNOWBELL. Shrub of Growth Regions 25, 27, 28, 29, 30; grown for ornament, Zone V. Including S. GRANDIFOLIA Ait., BIGLEAF SNOWBELL, of the southern part of the range.

Heterodera marioni (Cornu) Goodey, root knot. Md.

SWIETENIA (MELIACEAE)

SWIETENIA MAHAGONI Jacq., MAHOGANY. Large evergreen tree of C. America and West Indies, sometimes planted for shade in S. Fla.

Phyllosticta swietenia Alvarez Garcia, seedling blight. P. R.

SYMPHORICARPOS (CAPRIFOLIACEAE)

SYMPHORICARPOS ALBUS (L.) Blake, SNOWBERRY. Small shrub occurring nearly throughout the U. S.; the var. LAEVIGATUS (Fern.) Blake is cult. for ornament, Zone III. S. OREOPHILUS Gray, MOUNTAIN S. of the Western States, is included.

Alternaria sp., berry rot. Colo., Conn., Mass., N. Y. Has been designated A. solani forma symphoricarpi W. H. Davis but is of the general type A. brassicae (Berk.) Sacc.
Ascochyta symphoricarpophila Fairm., leaf spot. N. Y.
Botrytis cinerea Pers., berry rot. Conn., Mass., N. Y.
Cercospora symphoricarpi Ell. & Ev., leaf spot. Alaska, Mont., S. Dak.
Cladosporium sp., berry rot. Md., Va.
Colletotrichum sp. See Gloeosporium.

SYMPHORICARPOS ALBUS cont.
Diaporthe spiculosa (Alb. & Schw.) Nits., on twigs. N. Y.
Didymaria symphoricarpi Ell. & Ev., on leaves. Calif.
Diplodia symphoricarpi Sacc., on twigs. Calif., N. Y.
Fomes ribis (Schum. ex Fr.) Gill., collar rot. Kans., Mont.
Gloeosporium sp., berry and leaf spots. In part the conidial stage of the following (also reported as Colletotrichum sp.) but mostly Sphaceloma, q.v.
Glomerella cingulata (Ston.) Spauld. & Schrenk, anthracnose. Widespread. Ind., Mass., Mich., N. Y., Va.
Haplosporella symphoricarpi Pk., on dead twigs. N. Y.
Lasiobotrys symphoricarpi Syd., on leaves. Colo., Utah.
Microsphaera diffusa Cke. & Pk., powdery mildew. General.
Phyllosticta symphoricarpi Westend., leaf spot. N. Y., N. Mex., Wash.
Physalospora obtusa (Schw.) Cke., on twigs. N. J., N. Y.
Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Md.
Podosphaera oxyacanthae DC. ex DBy., powdery mildew. Wash.
Polyporus elegans Bull. ex Fr., on dead branches. Wash.
Puccinia crandallii Pam. & Hume, rust (O, I). N. Dak. to Mo., Calif. & Wash. II and III on Festuca and Poa spp.
P. symphoricarpi Hark., rust (III). Mont. to Colo., Calif. & Wash. Alaska.
Septoria signalensis Solheim, leaf spot. Wyo.
S. symphoricarpi Ell. & Ev. N. Dak. to Colo., Calif. & Wash.
Sphaceloma symphoricarpi Barrus & Horsfall, anthracnose, scab. Me. to Md., Ark. & Minn.; Calif., Colo., Oregon.

SYMPHORICARPOS OCCIDENTALIS Hook., WOLFBERRY. Small shrub of Growth Regions 15, 18, 21, 22, 23, 24; useful to wildlife.

Cercospora symphoricarpi Westend., leaf spot. Iowa, Kans., Mont., Nebr.
Cryptospora kansensis Ell. & Ev., on twigs. Kans.
Diaporthe spiculosa (Alb. & Schw.) Nits., on twigs. Kans.
Dibotryon symphoricarpi (Rehm) Petr., on twigs. N. Dak.
Diplodia symphoricarpi Sacc., on twigs. Kans.
Dothichiza symphoricarpi Petr., on twigs. N. Dak.
Fomes ribis (Schum. ex Fr.) Gill., on dead branches. N. Dak.
Microsphaera diffusa Cke. & Pk., powdery mildew. Widespread.
Nectria coryli Fckl., on twigs. N. Dak.
Pezizella dakotensis Rehm, on twigs. N. Dak.
Puccinia crandallii Pam. & Hume, rust (O, I). Colo., Mont., N. Dak., Wyo.
Septoria symphoricarpi Ell. & Ev., leaf spot. Mont., N. Dak., Wash.
Thyronectria lonicerae Seeler, on twigs. Colo., N. Dak.
Valsa symphoricarpi Rehm, on dead twigs. N. Dak.
Valsaria symphoricarpi (Ell. & Ev.) Theiss. & Syd., on dead twigs. Alaska, Mont., N. Dak.

SYMPHORICARPOS ORBICULATUS Moench., CORALBERRY. Shrub of Growth Regions 18, 20, 21, 22, 23, 24, 25, 27, 28, 29, 30. Sometimes grown for ornament, Zone II, and useful to wildlife and in soil conservation.

Alternaria sp., berry rot. Conn.
Cercospora symphoricarpi Ell. & Ev., leaf spot. Kans., Nebr., Texas.
Cryptospora kansensis Ell. & Ev., on twigs. Kans.
Helicobasidium purpureum (Pat.) Tul., root rot. Texas.
Microsphaera alni DC. ex Wint., powdery mildew. Ind., Ohio, W. Va.
M. diffusa Cke. & Pk. Widespread.
Phomopsis sp., stem gall. Md.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Puccinia crandallii Pam. & Hume, rust (O, I). Kans., Mo., Okla.

SYMPLOCOS (SYMPLOCACEAE)

SYMPLOCOS TINCTORIA (L.) L'Her., COMMON SWEETLEAF. Evergreen shrub or small tree of Growth Regions 27, 28, 29, 30; sometimes grown for ornament, Zone VII. Records on S. PANICULATA (Thunb.) Miq., SAPPHIRE-BERRY SWEETLEAF, of China, which is hardy in Zone V, are included.

Exobasidium symploci Ell. & Mart., bud gall. Gulf States to N. Car. to Ind.
Leptothyrium symploci (Cke.) F. Tassi, on leaves. S. Car.
Mycosphaerella sp., on leaves. Ga.
Septoria symploci Ell. & Mart., leaf spot. Fla., Miss., N. Car.
S. stigma Berk. & Curt., leaf spot. Ala.
S. tinctoria Dearn. & House. Ark.

SYNCARPIA (MYRTACEAE)

SYNCARPIA GLOMULIFERA Niedenz., TURPENTINE TREE. Evergreen tree of Australia grown in Far South for ornament.

Heterodera marioni (Cornu) Goodey, root knot. Fla.

SYRINGA (OLEACEAE)

SYRINGA AMURENSIS Rupr., AMUR LILAC. Shrub or small tree of Manchuria, cult. for ornament, Zone IV.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas. Also on S. chinensis Willd.

SYRINGA PERSICA L., PERSIAN LILAC. Shrub of W. Asia, cult. chiefly in the var. INTEGRIFOLIA Vahl., Zone V; also in hybrids with S. VULGARIS.
Cercospora lilacis (Desm.) Sacc., leaf spot. Miss.
Microsphaera alni DC. ex Wint., powdery mildew. Ill., Iowa, Minn., Nebr.

SYRINGA VULGARIS L., COMMON LILAC. Shrub or small tree of S.E. Europe, long cult. for ornament, Zone III; sometimes locally naturalized. Records on horticultural lilacs in general are given here though some of the hosts belong to hybrids of this with various Asiatic spp.

Alternaria spp., on spotted leaves (probably mostly secondary but sometimes extending other lesions; both A. tenuis Auct. and A. brassicae (Berk.) Sacc. types occur.) Cosmopolitan.
Armillaria mellea Vahl ex Fr., root rot. Calif., Miss.
Ascochyta syringae Bres., on leaves. Oregon.
Botrytis cinerea Pers., gray mold blight. N.E. States, Pacific Northwest.
Cercospora lilacis (Desm.) Sacc., leaf spot. Widespread.
C. macromaculans Heald & Wolf. Iowa, Okla., Texas.
Cladosporium sp.(? C. herbarum Lk.), leaf blotch (probably mostly secondary). Cosmopolitan.
Corticium stevensii Burt, thread blight. Fla., Miss., N. Car.
Dendrophoma albomaculans (Schw.) Starb. and D. syringae Dearn., on twigs. N. Y.
Diaporthe medusaea Nits., on branches. Me.
Dothiorella berengeriana Sacc., on branches. Ohio.
Gloeosporium syringae Allesch. (? Glomerella cingulata (Ston.) Spauld. & Schrenk.), ? shoot blight. Conn., Mass.
Heterosporium syringae Oud., leaf blotch (following bacterial blight). N. J.
Hymenochaete agglutinans Ell., stem girdle. Conn.
Macrophoma halstedii (Ell. & Ev.) F. Tassi, leaf spot. Conn., N. J., N. Y.
Macrosporium sp. See Alternaria and Pleospora.
Microsphaera alni DC. ex Wint. , powdery mildew. General.
Myxosporium depressum Sacc., on twigs. Ohio, N. Y., Va.
Phomopsis depressa (Lév.) Trav., on twigs & capsules. Ohio, N. Y. Conidial stage of Diaporthe eres Nits.
Phyllosticta sp., leaf spot. Mass.
(P. halstedii Ell. & Ev.): Macrophoma halstedii.
P. porteri Tehon & Daniels. Ill.
P. syringae Westend. (? Ascochyta syringae). Wash.
P. syringella (Fckl.) Rabh. (as Phoma syringae Fckl.), on leaves. N. Y., Wis.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Texas.
Physalospora obtusa (Schw.) Cke., on twigs & branches, ? dieback. Mass. to Va. & Ohio.
Phytomonas syringae (Van Hall) Bergey, bacterial blight, twig canker. N.E. States to Ala. and Ill.; Pacific Coast States.
P. tumefaciens (EFS. & Town.) Bergey, crown gall. Conn.
Phytophthora cactorum (Leb. & Cohn) Schroet., blossom blight, dieback. Iowa, Md., Mass., Minn., N. J.
P. syringae Kleb., shoot blight. Md., N. Y.

SYRINGA VULGARIS cont.

Pleospora herbarum (Pers. ex Fr.) Rabh. (Stemphylium botryosum Wallr.), leaf spot (secondary). Md.

Polyporus gilvus (Schw.) Fr., wood rot. Md.

P. versicolor L. ex Fr. Mo., N. Car., N. Y.

Sclerotinia sclerotiorum (Lib.) DBy., shoot blight. Wash.

Sphaeropsis syringae Pk. & Clint., on leaves & twigs (probably secondary). N. J., Pa.

Stereum purpureum Pers., wood rot. Okla.

Thielaviopsis basicola (Berk.) Ferr., root rot. Conn.

Graft blight, -- incompatibility of lilac scion on privet stock. Occasional. (A "graft blight" in England is attributed to a virus).

Mosaic (ring spot), ? virus. Mich., Minn.

WEATHER OF AUGUST AND OF THE SUMMER OF 1942

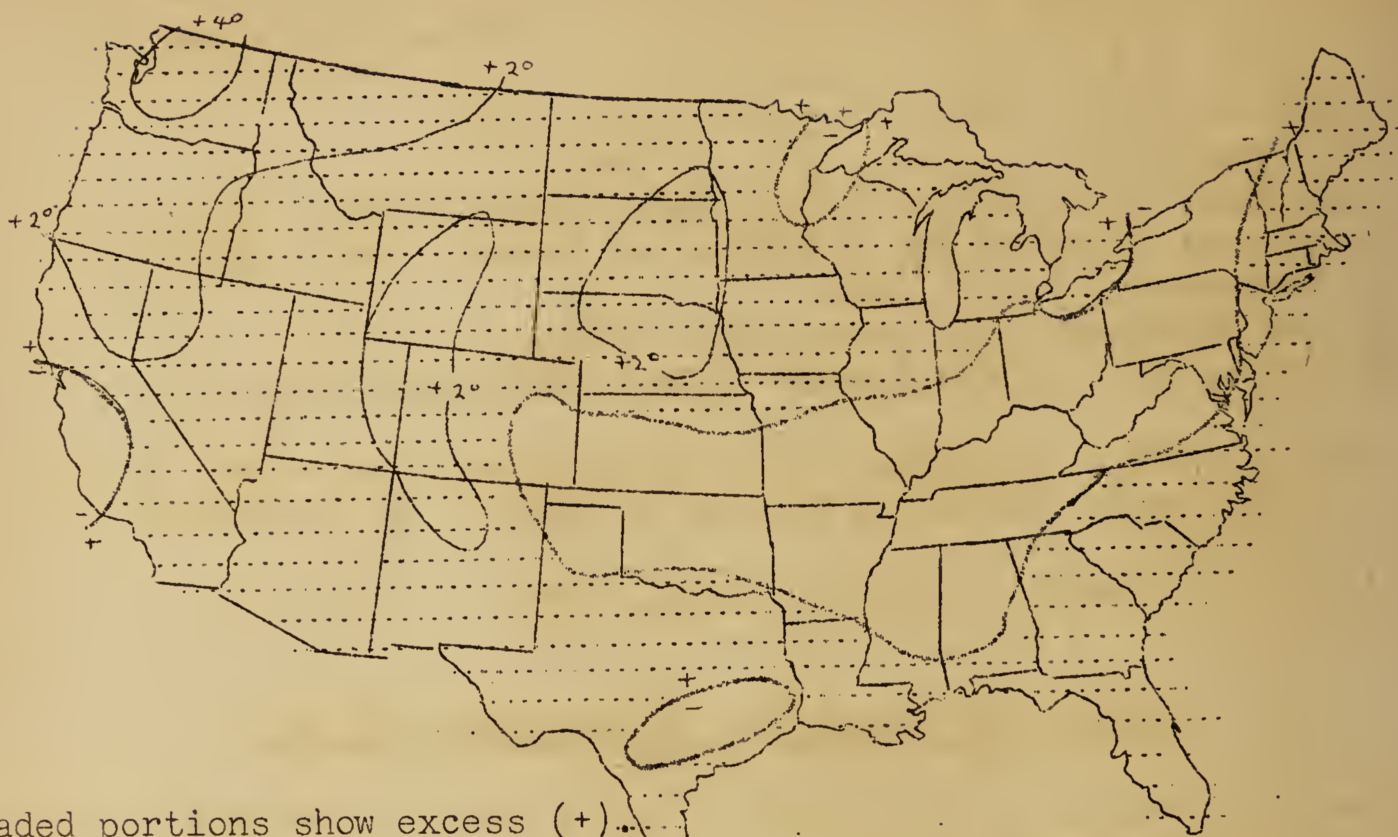
(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin for week ending September 8, 1942).

THE WEATHER OF AUGUST 1942: Temperatures for August, as a whole, were remarkable for widespread uniformity in relation to normal, the monthly means being close to normal in nearly all sections of the country; the general rule was to slight excesses. Figure 1 shows that only limited areas had departures as great as 2°, all plus, with only a few stations in the extreme northwest showing as many as 4° above normal.

Precipitation for the month was much less evenly distributed, as shown on Figure 2. The extreme northeast and extreme southeast had rather large deficiencies, while the middle Atlantic area had one of the wettest Augusts of record. In general, the southern half of the country had above normal, except the Southeast, and the northern half below normal, except a few limited areas.

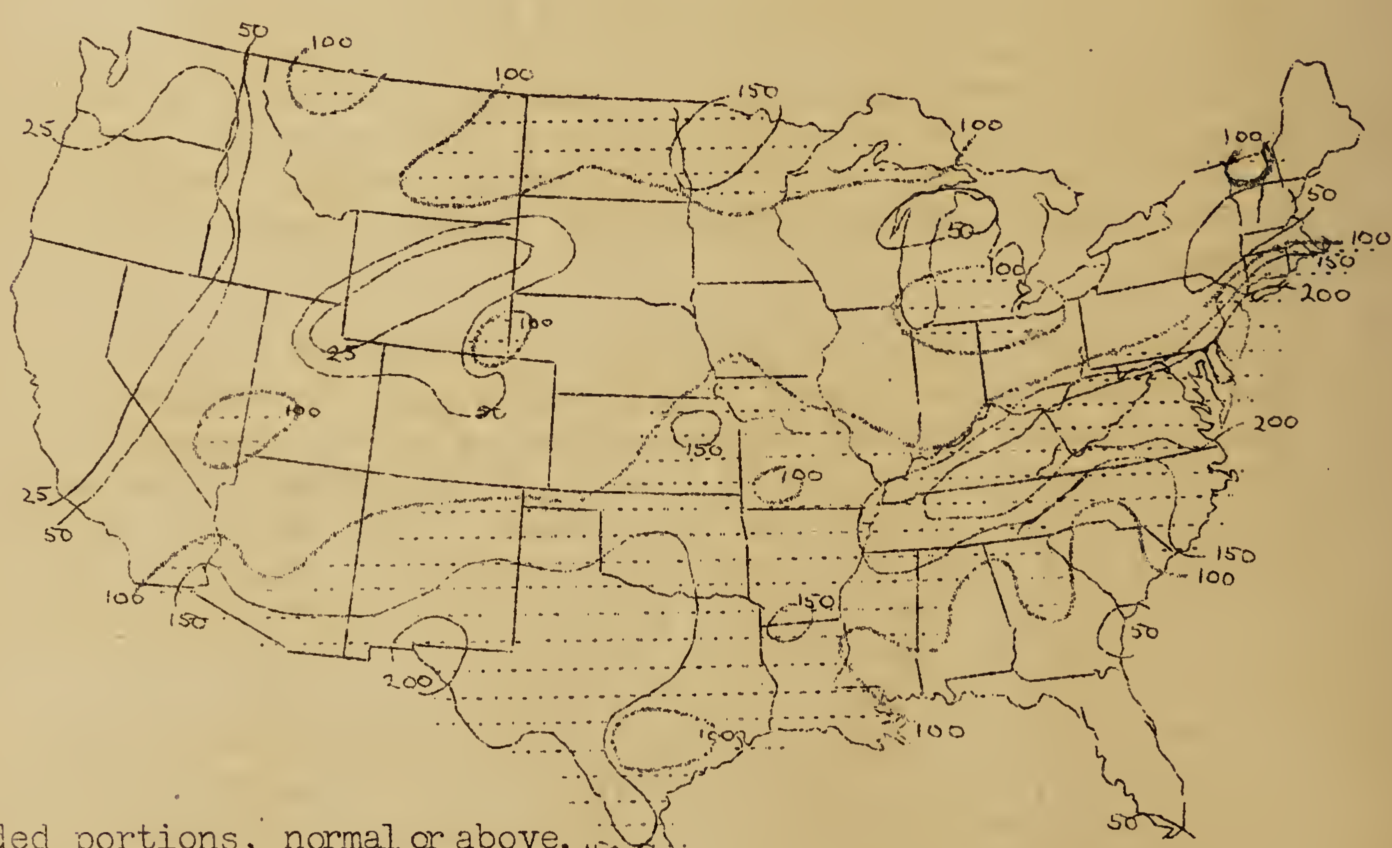
THE SUMMER OF 1942: Figure 3 shows that the temperature for the summer of 1942 was slightly above normal in all sections. The summer, like August, was noteworthy for uniformity of the average temperature in relation to normal; no section had as many as 2° below normal and only small areas exceeded 2° above. In the eastern United States, especially, there has been for a long time a marked tendency for summers to run above normal in temperature. For example, in Washington this last summer was the 13th consecutive one with average temperature above normal, the other 12 ranging from +0.6° in 1940 to +2.8° in 1930.

Figure 4 shows for the summer season the geographic distribution of rainfall in relation to normal. The relatively heaviest amounts occurred in the west Gulf area and Middle Atlantic States, where some stations reported from one-and-a-half to twice the normal amount. As a general rule, total falls were above normal over the eastern two-thirds of the country and below normal over the western third.



Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 1. -- Departure of Mean Temperature from Normal, August 1942

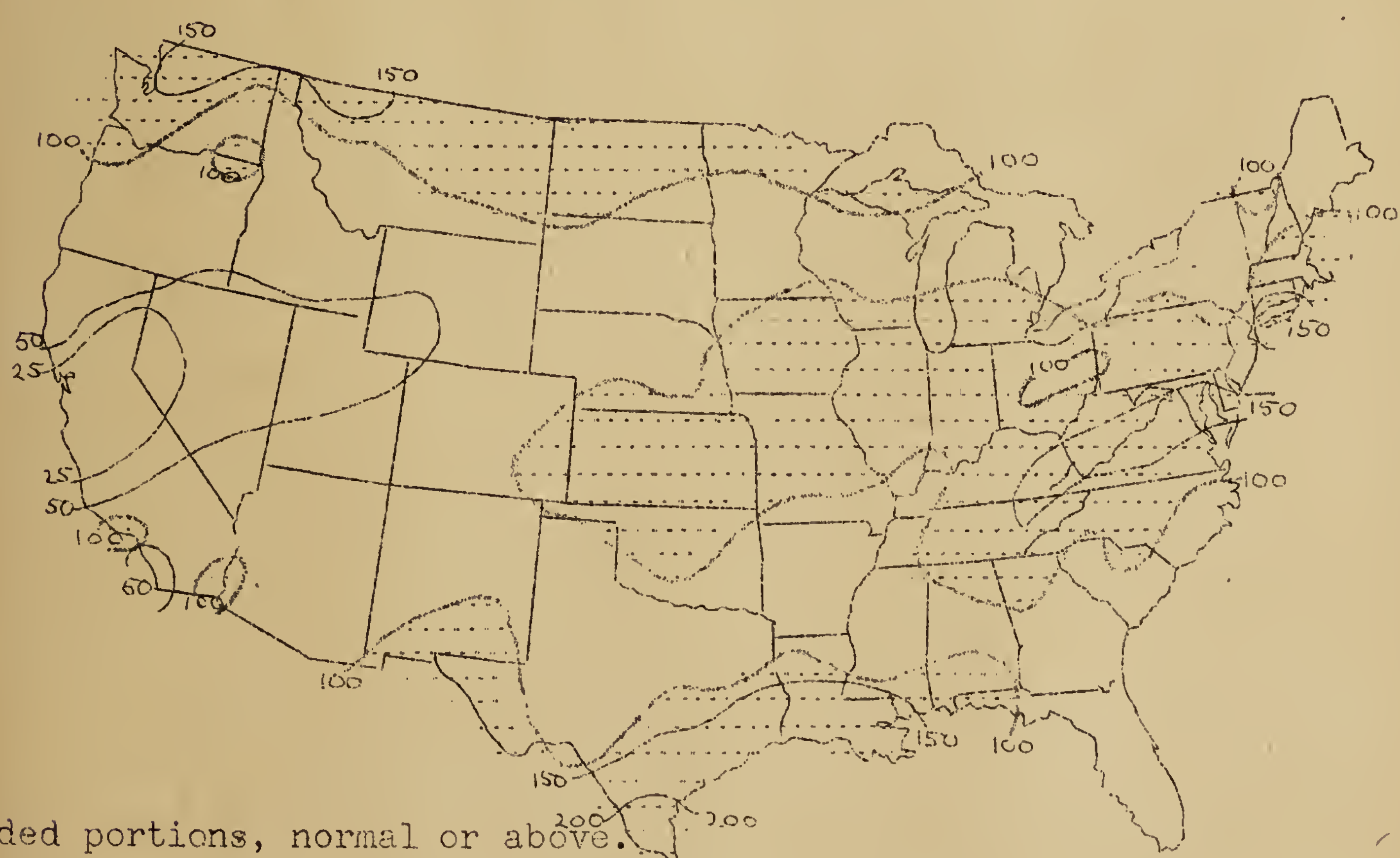


Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Fig. 2. -- Percentage of Normal Rainfall, August 1942

Shaded portions show excess (+).
Unshaded portions show deficiency (−).
Lines show amount of excess or deficiency.

Fig. 3. -- Departure of Mean Temperature from Normal, for the Summer, June - Aug. 1942



Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Fig. 4. -- Percentage of Normal Rainfall for the Summer, June - Aug. 1942

N P
6
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3

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
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UNITED STATES DEPARTMENT OF AGRICULTURE

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IN THIS ISSUE

ERGOT EPIPHYTOTIC IN SOUTHWESTERN PASTURES

K. Starr Chester and C. L. Lefebvre

In the winter of 1941-42, many unexplained cases of cattle abortion were reported to John Stovall, county agent of Hemphill County in the Texas Panhandle. When tests for Bang's disease and trichomoniasis, 2 common causes of abortion, proved negative, ergot poisoning was suspected, and D. A. Savage, pasture specialist at the Southern Great Plains Experiment Station in Woodward, Oklahoma, was called in consultation. Cases of abortion were found in 450 beef cows on 6 ranches. In all cases the cows had fed on winter pasture which consisted to a large extent of big bluestem (*Andropogon furcatus* Muhl.), sand bluestem (*Andropogon hallii* Hack.), and Indian grass (*Sorghastrum nutans* (L.) Nash), all of which were carrying considerable amounts of ergot, tentatively identified as *Claviceps purpurea* (Fr.) Tul. The grazing habits of cattle lead them to avoid the tough and unpalatable mature heads of these grasses under normal pasture conditions. During the winter, however, snow had covered the more succulent foliage, while rain and snow had so softened the ergot-bearing heads that these were eaten freely.

Not only in the Texas Panhandle but in the pasture areas of adjacent States as well, ergot had been unusually plentiful in 1941. At Geary, Oklahoma, for example, a 9-pound sample of pure ergot was readily obtained from western wheat grass. This was submitted to Dr. W. T. Huffman, Veterinarian in Charge of Stock Poisoning by Plants, Bureau of Animal Industry, U.S.D.A., who conducted preliminary feeding experiments in which a cow and sheep were killed with typical symptoms of ergotism.

The moisture conditions of the spring of 1942 appeared favorable for a further increase in grass ergot, and this fact, together with the experience of the preceding winter, led Mr. Savage to call a meeting of veterinarians, plant pathologists, county agents, and stockmen in order to appraise the situation and arrive at such control recommendations as might seem justified. This meeting was called at Canadian, Texas, August 24 and 25, and was attended by Texas, Oklahoma, and Federal specialists and by 60 stockmen.

Examination of Hemphill County pastures showed that Mr. Savage's concern was fully justified. An abundance of ergot was found in wildrye grasses (*Elymus canadensis* L. and *E. virginicus* L.) and in western wheatgrass (*Agropyron smithii* Rydb.). The other 3 common hosts of ergot, the bluestems and Indian grass, were just heading, and the cloudy or rainy weather at the time promised to contribute to another heavy infestation in these winter grasses in 1942. The degree of infestation varied from 5%+ in western wheatgrass to an estimated 100% in Canada wildrye. Field counts of affected heads were misleading, as most of the larger ergot sclerotia had shattered, while many of the apparently unaffected heads contained one or several small sclerotia, nearly or entirely covered by

the glumes, and seen only after threshing each head individually. The soil under this wild rye was so littered with sclerotia that a handful could be gathered from the ground in a few minutes. In spite of this shattering, individual heads showed from 1 to 27 sclerotia per head. A 20-ton haystack from one hay meadow was sampled. Although the hay consisted to a large extent of other grasses than ergot hosts, each handful of hay, when beaten out, was found to contain from a few to a dozen or more sclerotia.

Another example of the amount of ergot present on grasses in this part of the country was demonstrated by separating the ergot sclerotia from the seed of random samples taken from a 10-bushel lot of western wheatgrass grown at Booker, Texas. This sample contained 41% ergot by weight. Sclerotia are to be removed from the remainder of the sample and used in feeding trials to determine the dosage necessary to cause injury in cattle. In the examination of the literature on ergot poisoning, it is apparent that controlled feeding experiments have been used very little in determining the injury caused by ergot.

Although ergot infestation was not found on the bluestems in the pastures examined, there was abundant evidence of an infestation in a nursery of sand bluestem growing on the Experiment Station at Woodward, Oklahoma. At this time only the "honey dew" stage of the ergot was found. By the middle of September this stage had become quite abundant in the bluestems and Indian grass in western and central Oklahoma.

Following these field inspections and a public stockmen's meeting on ergot, the group organized, under the chairmanship of Mr. Savage, as an ergot council to assemble all pertinent information on the ergot problem and to undertake research on such phases of the problem as are not yet fully understood.

Subcommittees were appointed to assemble information on local case studies and on the etiology, epiphytology, clinical symptoms, and toxicology of the southwestern ergot. Plans were laid for animal tests of ergot toxicity at the A. and M. Colleges of Texas and Oklahoma and at the Bureau of Animal Industry Stations at Salina, Utah and Beltsville, Maryland. Fullest cooperation was volunteered by leaders of the local livestock industry, including an offer of the use of the facilities of a 6,000-acre ranch.

In conclusion of the meeting a short statement was prepared for release to the press, defining the ergot problem of 1942 and offering the following suggestions on ergot control under conditions of the Southern Great Plains:

1. Meadows likely to become infested could be cut for hay before the majority of the plants head out, making a finer quality hay and reducing the chances for infestation.
2. Cutting the ergotized heads and removing them from pastures or meadows are suggested for heavy infestations where the cutting is feasible.
3. Feeding of hay that contains many infected heads should be avoided.
4. Dense bottomland pastures might be grazed heavily early in the summer to keep the plants from maturing and becoming infected.
5. Grazing upland ranges in a similar intensive manner is likely to be injurious to the vegetation and would not eliminate many plants that head out in the protection of brush.

6. Removing of infected heads from upland ranges infested with brush is a difficult problem. Probably the safest measure to employ in situations of this kind is either to remove the livestock from infested ranges or provide them with an abundance of clean forage during the fall and winter when the heads are softened by moisture and other forage is covered with snow.

7. Avoid intensive livestock working operations in areas heavily infested with ergot.

(OKLAHOMA AGRICULTURAL EXPERIMENT STATION AND DIVISION OF FORAGE CROPS AND DISEASES COOPERATING.)

THE MEADOW NEMATODE ON TOBACCO IN SOUTH CAROLINA

T. W. Graham

The meadow nematode, Pratylenchus pratensis (de Man) Filipjev, caused serious damage to tobacco in the South Carolina area as shown by surveys during the past 3 years. Data this year were collected from 33 diseased tobacco fields in Darlington, Florence, Lee, and Sumter counties. Records were obtained on yield reduction, extent and type of root injury, and on the crops that preceded tobacco. Roots of all collections were examined to distinguish between the effects of the meadow nematode and those of the root-knot nematode, Heterodera marioni (Cornu) Goodey. Root collections were made also for microscopic examination.

Tobacco roots affected by the meadow nematode are easily distinguished from those attacked by the root-knot nematode. The former, in initial stages of attack, causes elongate reddish brown lesions on the secondary roots. Later, these roots slough off and decay. Root knot is easily recognized by characteristic root galls. Above ground symptoms of attack by both nematodes are indistinguishable as both parasites severely retard top growth.

As determined by root symptoms and microscopic examination, major damage in 24 fields was clearly due to the meadow nematode. Numerous specimens of P. pratensis were found in all except one of the 33 collections. In 7 of the collections, root knot and the meadow nematode were both abundant. In 2 collections root knot was the major cause of the damage.

Reductions in yield, conservatively estimated, ranged from 5 to 50%, with a calculated average loss of 28% from all collections where the meadow nematode was entirely or partially responsible. The 2 root-knot locations had estimated losses of 30 and 40%.

In the fields visited, crops used to precede tobacco were as follows: tobacco following tobacco, 17 locations; tobacco after cotton, 12 locations; tobacco after corn, 1 location; tobacco after pepper, 1 location; and 2 were undetermined. The meadow nematode had been found on both cotton and corn and these crops probably serve as alternate hosts between tobacco crops.

These observations are in agreement with those made in previous years in this area and confirm the suspected role of the meadow nematode as an important parasite on tobacco.

(DIVISION OF TOBACCO INVESTIGATIONS, BUREAU OF PLANT INDUSTRY, U.S. DEPARTMENT OF AGRICULTURE, IN COOPERATION WITH SOUTH CAROLINA AGRICULTURAL EXPERIMENT STATION, FLORENCE, S. C.).

CURRENT NOTES ON PLANT DISEASES IN MASSACHUSETTS

C. C. Boyd

On August 5 [PDR 26:367-368. Sept. 1] I stated that downy mildew [Pseudoperonospora cubensis] had not yet been reported in Massachusetts. Neither did I find it in Plymouth County or Essex County on August 13 and 14, nor in the 3 Connecticut Valley Counties during the month of August.

On September 23, I visited the same cucumber fields in Plymouth County that I examined on August 14, and found downy mildew in rather advanced stages. One grower stated that the disease first "struck" his field about 3 to 4 weeks previously, or about August 26 to September 2, but that it progressed more slowly than usual. On September 24, I found downy mildew on both cucumbers and muskmelons in Bristol County. It had probably been present for about the same period as in Plymouth County. It was defoliating cucumber vines but causing only slight damage to melons.

Scab [Cladosporium cucumerinum] has been severe on many plantings of cucumbers; but on melons, scab, macrosporium blight [Alternaria cucumerina] and anthracnose [Colletotrichum lagenarium] each have caused only light to moderate damage this season.

On August 28, I observed a leaf-spot disease on muskmelons that I had not seen previously, nor does it appear to be described in the literature. It is a bacterial disease whose lesions in the advanced stages somewhat resemble angular leaf-spot of cucumbers. Dr. W. H. Burkholder at Cornell is studying the organism.

Late blight continued to develop on celery [Septoria] and potatoes [Phytophthora infestans] during August and September. Some celery fields in Middlesex County not protected properly or at all were virtually ruined by the disease during August. Late blight (Phytophthora) of tomatoes progressed slowly throughout August but has made rapid headway in home gardens and commercial plantings this month.

On apples, bitter rot, Brooks' spot, and black pox [Glomerella cingulata, Mycosphaerella pomi, Helminthosporium papulosum] are more damaging than usual this fall in Bristol and Plymouth Counties. In one orchard in Seekonk, bitter rot is causing a total loss in 2 or 3 Greening trees in one corner of the orchard where a light infection was observed last year, and where good control of scab [Venturia inaequalis] and other diseases was obtained this year.

(MASSACHUSETTS STATE COLLEGE).

REPORTS ON LEAF BLIGHT AND OTHER CORN DISEASES

HELMINTHOSPORIUM LEAF BLIGHT OF CORN IN NEW YORK: At the request of C. L. Messer, County Agent of Cayuga County, New York, several fields of corn near Venice Center, severely affected with Helminthosporium leaf blight, were visited on September 14, 1942. On many plants, the lower leaves were dead, those farther up the stalk were badly fired, and large dead spots occurred in the latter and on the top leaves. The severely affected fields had the appearance of being struck by a frost. At the time

the observations were made, the corn needed about 10 days more to be prime for ensilage but, because of the disease, it was being cut then.

Not all varieties were equally affected. Cornell Hybrids 29-5 and 34-53 were most severely damaged, there was considerable blight in Cornell 11, and least in Cornell Hybrid 29-3. All fields had made an excellent growth and, until the blight appeared, gave promise of a heavy yield. One field planted to 29-5 on the east and 29-3 on the west showed the division between the 2 varieties plainly by the greater damage to the foliage on the former.

An examination of the lesions and dead leaves showed an abundance of sporophores and spores of the fungus. They were found also on lesions on bracts of the ear and a few were present on parts of the tassels. The size and character of the sporophores and spores indicate that the fungus is Helminthosporium turcicum Pass.

A little later, specimens of this disease on 29-3 and West Branch Sweepstakes were sent me by Paul H. Allen, County Agent of Sullivan County who said that it had appeared recently in several parts of the county. It has also been reported as occurring on hybrid corns on the college farm. It probably is present in other parts of the State but I have had no further reports. (M. F. Barrus, New York State College of Agriculture, September 29).

CORN DISEASES IN MARYLAND: Helminthosporium leaf blight (Helminthosporium turcicum) is very destructive on hybrid field corn and late planted sweet corn this year throughout the State. Entire fields appear as if frost or fire had struck the leaves. Damage to the fodder is severe on some susceptible varieties and such dried leaves will make poor silage if used without water. Infection continues to spread as evidenced by the numerous small leaf lesions. Yields will not be materially reduced, although many ears are spongy and have broken down earlier than usual on account of this disease.

Stewart's disease or bacterial wilt (Phytomonas stewartii) was very destructive on hybrid field corn in early August and caused considerable loss in yield of corn and fodder, and many fields were harvested 2 weeks earlier than usual in order to save the fodder. Bacterial infection can still be seen on some of the greener leaves mixed with a heavy infection of Helminthosporium. Microscopic examination of sectioned leaves often shows the presence of oozing bacteria and spores of Helminthosporium in the same lesion.

Diplodia corn ear rot (Diplodia zeae) and Gibberella ear rot (Gibberella zeae) are more prevalent this year than usual. Some fields show as much as 20% of the ears affected. Heavy and soaking rains during the late summer may account for the heavy infection.

Physoderma disease of corn (Physoderma zeae-maydis) is apparent in the State in greater amount than usual. In some cases the sheath is completely blackened and the nodes are infected on the lower part of the plant. (E. A. Walker, University of Maryland. September 28).

HELMINTHOSPORIUM LEAF SPOT AND STEWART'S WILT ON FIELD CORN IN INDIANA: Helminthosporium turcicum is most abundant in the southeastern quarter of the State. In the northern tier of counties it is possible to find lesions on the leaves, but no damage occurs. In Vigo County the disease was doing serious damage to popcorn, and was abundant in field corn but apparently not causing any serious injury. In Vanderburgh County no serious injury could be found in August.

The disease is most serious on early planted corn. One field in Wayne County planted in late April was so heavily infected that practically every plant was dead on September 10. Most of the ears will be chaffy. Other fields showed equally severe infection. Marked differences in resistance are evident among hybrids, depending upon the relative resistance of their component inbreds. Practically all the medium season hybrids are susceptible, while the later hybrids are not as badly affected.

Late infection by Aplanobacter [Phytomonas] stewartii was present in several of the fields examined but apparently doing little damage. In Shelby County it was observed in greater prevalence than in other areas. (C. T. Gregory, Purdue University Agricultural Extension Department. September 22).

BRIEF NOTES ON PLANT DISEASES

PERONOSPORA ON SOYBEAN IN VIRGINIA: Downy mildew of soybeans, caused by Peronospora manshurica (Naoum.) Gäumann, has been unusually severe in the vicinity of Norfolk during the latter part of August and in September of this year. This disease occurs on soybeans every year, but it usually causes only small faint yellow spots on the leaves, and the fungus usually fruits very sparsely. This year the leaf spots were much larger than usual and the fungus fruited abundantly. Infection in many cases was so severe that large areas of the leaves became necrotic and turned brown.

The early part of the summer was extremely hot and dry and no mildew was observed on soybeans during that period. Rainfall was abundant and the temperature was moderate during the latter part of August, and these conditions were apparently very favorable for the development and spread of the disease.

Although the downy mildew has been abnormally abundant this year, the damage has not been sufficient to cause any appreciable reduction in yield of either hay or seed. (Richard P. Porter and Harold T. Cook, Virginia Truck Experiment Station, Norfolk).

CARNATION BACTERIAL WILT IN INDIANA: The first known case of the bacterial wilt of carnations in Indiana was found in a greenhouse at Fowler in August. The organism was isolated and has been identified by Dr. W. H. Burkholder as Phytomonas caryophylli. The disease was apparently introduced in cuttings taken from flowers purchased from Chicago. It has not yet been found in Indiana-produced plants. (C. T. Gregory, Purdue University Agricultural Extension Department. September 22).

CHECK LIST REVISION

Freeman Weiss

TABEBUIA (BIGNONIACEAE)

TABEBUIA spp., TRUMPET-TREE. Evergreen trees or shrubs of tropical America, sometimes grown for ornament in the far South.

Apiosphaeria guaranitica (Speg.) Höhn., black leaf spot. Canal Zone.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
On T. persica.
Meliola bidentata Cke. and M. tecomae F. L. Stevens, black mildew. P. R.
Mycosphaerella tabebuiae Miles, leaf spot. P. R.
Prospodium plagiopus (Mont.) Arth., rust (II, III). P. R.
Witches'-broom, cause unknown - suspected virus. P. R.

TABERNAEMONTANA (APOCYNACEAE)

TABERNAEMONTANA spp. Small trees of tropical America, sometimes grown for ornament.

Cephaleuros virescens Kze., green scurf. Fla.
Gloeosporium tabernaemontanae Speg., leaf spot. Fla.
Hypospilina ospinae (Chardon) Chardon & Toro, on leaves. P. R.
Meliola tabernaemontanae Speg., black mildew. Canal Zone, P. R.

TAMARINDUS (LEGUMINOSAE)

TAMARINDUS INDICA L., TAMARIND. Tropical evergreen tree grown for edible fruit, timber and ornament in S. Fla., and West Indies.

Heterodera marioni (Cornu) Goodey, root knot. Fla.

TAMARIX (TAMARICACEAE)

TAMARIX spp., TAMARISK. Deciduous shrubs or small trees of Europe and Asia, cult. for ornament and hedges. T. PENTANDRA Pall. is hardy in Zone II, other spp. commonly cult. as T. PARVIFLORA DC. in Zone IV, T. JUNIPERINA Bge. and T. GALLICA L., in Zone V, the latter sp. locally naturalized throughout its zone.

Botryosphaeria tamaricis (Cke.) Theiss. & Syd., on branches. S. Car.
Diplodia tamariscina Sacc., on branches. N. Y.
Leptosphaeria tamaricis (Grev.) Sacc., on branches. Pa.
Phymatotrichum omnivorum (Shear) Dug., root rot. Calif., Texas.
On all tested spp.

TAMARIX spp. cont.
Polyporus sulphureus Bull. ex Fr., wood rot. Md.
Pyrenopeziza tamaricis (Roum.) Sacc., on dead stems. N. Y.
Sphaerotheca humuli DC. ex Burr., powdery mildew. Ind.

TAMONEA (MELASTOMACEAE)

TAMONEA spp. Tropical American shrubs, sometimes planted for ornament.

Asterina guianensis Ryan, black mildew. P. R.
Lembosia rollineae Rehm, black mildew. P. R.
Morenoella miconiae Ryan, black mildew. P. R.

TAXODIUM (PINACEAE -- TAXODIACEAE)

TAXODIUM spp., BALD-CYPRESS, chiefly T. DISTICHUM (L.) Rich., SOUTHERN B., deciduous tree of Growth Regions 17, 20, 25, 28, 29, 30, 31, 32; also T. ASCENDENS Brongn., POND B., of G. R.'s 29, 30. Both spp. furnish cypress timber of the lumber industry, and the former is grown for ornament, Zone IV.

Fomes applanatus (Pers. ex Fr.) Gill., butt rot. Fla.
F. extensus Lév., white pocket heart rot. Fla.
F. geotropus Cke., brown pocket heart rot. Southern States especially Fla. to La. The term pecky cypress is applied to wood affected with this pocket rot.
Geotrichum sp., pink wood stain. Gulf States.
Lenzites spp., especially L. trabea Pers. ex Fr., brown cubical rot of logs & timber. L. saepiaria Wulf. ex Fr. and L. striata Sw. ex Fr. also reported from Fla.
Mycosphaerella taxodii (Cke.) Lindau, on needles. S. Car.
Pestalotia funerea Desm., twig blight. Texas.
Phomopsis occulta Trav., on twigs. N. Car.
Polyporus spp., wood rot, usually on dead trunks and logs, sometimes on living trees. P. abietinus Dicks. ex Fr., S. Car.; P. gilvus (Schw.) Fr., La.; P. hirsutus Wulf. ex Fr., S. Car.; P. tenuis (Sacc.) Overh., Fla., La.; P. versatilis (Berk.) Overh., Ga., La.; P. versicolor L. ex Fr., Fla., La.
Poria spp., wood rot usually of logs, sometimes dry rot of timber. P. cocos (Schw.) Wolf, Tenn.; P. juniperina Murr., Ark.; P. incrassata (Berk. & Curt.) Burt, Southern States; P. taxodium Baxter, Ill.
Septobasidium spp., felt fungus. S. mariani Bres., S. pseudopedicellatum Burt, S. taxodii Couch, La.

TAXUS (TAXACEAE)

TAXUS BREVIFOLIA Nutt., PACIFIC YEW. Evergreen tree of Growth Regions 1, 2, 4, 12; grown for ornament, Zone VI.

Armillaria mellea Vahl ex Fr., root rot. Idaho

TAXUS BREVIFOLIA cont.
Diplodia taxi (Sow. ex Fr.) De Not., on needles. Oregon.
Fomes hartigii (Allesch.) Sacc. & Trot. (? F. robustus Karst.), brown cubical heart rot. Oregon.
F. roseus (Alb. & Schw. ex Fr.) Cke., Idaho.
Herpotrichia nigra Hartig, needle blight. Idaho.
Phyllostictina hysterella (Sacc.) Petr., twig blight. Idaho, Mont., Wash. Conidial stage of Physalospora gregaria var. foliorum Sacc.
Polyporus schweinitzii Fr., butt rot. Idaho.
Sphaerulina taxi (Cke.) Massee, needle blight. Calif., Idaho, Oregon, Wash.
Xenodomus taxi Petr., on needles. Idaho.

TAXUS CANADENSIS Marsh., CANADA YEW. Evergreen shrub of Growth Regions 21, 22, 23, 24, 26, 27; furnishes food for wildlife and grown for ornament, Zone II.

Diplodia taxi (Sow. ex Fr.) De Not., on needles. N. Y.
Leptothyrium sp., on needles. N. Y.
Phacidium taxi Fr., on needles. Wis.
P. taxicolum Dearn. & House. N. Y.
Rhizoctonia solani Kühn, damping off. Conn.
Sphaerulina taxicola (Pk.) Berl., leaf & twig blight. N. Y., Pa.

TAXUS spp., horticultural types. Chiefly forms of T. BACCATA L., ENGLISH YEW, evergreen tree of Europe, cult. for ornament, Zone VI; and T. CUSPIDATA Sieb. & Zucc., JAPANESE YEW, evergreen tree of N. E. Asia, cult. for ornament, Zone IV.

Pestalotia sp., on twig cankers, ? secondary. Pa.
P. funerea Desm., twig blight. Mass.
Phomopsis occulta Trav., on twigs. N.E. States.
Phyllosticta taxi Hollos, on needles. Va.
Phytophthora cinnamomi Rands, seedling blight. Md.
Rhizoctonia solani Kühn, damping off. Conn.
Sphaeropsis sp. (? Macrophoma taxi (Berk.) Berl. & Vogl.), twig blight. N. J.
Sphaerulina taxi (Cke.) Mass., needle blight. Oregon.

TECOMARIA (BIGNONIACEAE)

TECOMARIA CAPENSIS (Thunb.) Spach, CAPE-HONEYSUCKLE. Evergreen shrub of S. Africa, grown in hedges and for ornament, Zone VII.

Armillaria mellea Vahl ex Fr., root rot. Calif.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Glomerella cingulata (Ston.) Spauld. & Schrenk, leaf spot. Texas.

TECTONA (VERBENACEAE)

TECTONA GRANDIS L., TEAK. Large tree of S.E. Asia, sometimes grown for ornament in Hawaii and the far South.

Cercospora tectoniae F. L. Stevens, leaf spot. T. H.

TERAMNUS (LEGUMINOSAE)

TERAMNUS UNCINATUS (L.) Sw. Woody vine of tropical America.

Cercospora maricaoensis Young, leaf spot. P. R.
Meliola bicornis Wint., black mildew. P. R.
Phakopsora vignae Arth., rust (II). P. R.
Phyllachora galactiae Earle, black leaf spot. P. R.
Uromyces cologaniae Arth., rust (II, III). P. R.

TERMINALIA (COMBRETACEAE)

TERMINALIA CATAPPA L., INDIAN-ALMOND. Tree of Old World tropics, sometimes planted for shade in S. Fla., and tropical America.

Fusicoccum sp., on twigs. P. R.
Trabutia bucidae Chardon, black leaf spot. P. R.

TETRAGASTRIS (BURSERACEAE)

TETRAGASTRIS spp. Tropical American trees.

Meliola burseracearum F. L. Stevens, black mildew. Canal Zone, P. R.

TETRAPANAX (ARALIACEAE)

TETRAPANAX PAPYRIFERUM C. Koch, RICE-PAPER PLANT. Shrub of Formosa used for rice-paper manufacture, sometimes grown for interest in the far South.

Heterodera marioni (Cornu) Goodey, root knot. Fla.

TETRAZYGIA (MELASTOMACEAE)

TETRAZYGIA ELAEAGNOIDES (Sw.) DC., CENIZO. Tropical American shrub.

Asterina dilabens Speg., A. tetrazygiae Ryan, black leaf spot. P. R.
Dothidina peribebuyensis (Speg.) Chardon, black leaf spot. P. R.
Guignardia tetrazygiae F. L. Stevens, leaf spot. P. R.

THEA (THEACEAE)

*THEA SINENSIS L. (CAMELLIA SINENSIS (L.) Ktze.), TEA. Evergreen shrub of S.E. Asia, sometimes grown in the South for interest and earlier tested there commercially.

Cephaleuros virescens Kze., green scurf. Fla., S. Car.
Glomerella cingulata (Ston.) Spauld. & Schrenk, on leaves. Fla., S. Car., Texas. (Colletotrichum camelliae Massee and probably C. carveri Ell. & Ev. belong to this).
Pestalotia guepini Desm., leaf spot, twig blight. S. Car.
Phyllosticta erratica Ell. & Ev., on leaves. Ala.

THEOBROMA (STERCULIACEAE)

THEOBROMA CACAO L., CACAO. Small evergreen tree of tropical America, source of cocoa and chocolate; occasionally grown in Puerto Rico but commercial cultivation is farther south.

Calonectria rigidiuscula (Berk. & Br.) Sacc. (Fusarium decemcellulare Brick), on spotted pods & branch cankers. P. R.
Cephaleuros virescens Kze., algal spot, "red rust". P. R.
Colletotrichum spp., anthracnose, pod spot, dieback. P. R. Various specific names have been applied to what are probably only strains of C. gloeosporioides Penz., the conidial stage of Glomerella cingulata (Ston.) Spauld. & Schrenk.
Corticium salmonicolor Berk. & Br., thread blight, "pink disease". P. R.
Diplodia theobromae (Pat.) Nowell, (D. cacaoicola P. Henn.), dieback, brown rot of pods. Fla., P. R., Virgin Is. Conidial stage of Physalospora rhodina (Berk. & Curt.) Cke.
(Fusarium decemcellulare Brick): Calonectria rigidiuscula.
(Nectria bainii Massee): Calonectria rigidiuscula.
Phytophthora palmivora Butl. (P. faberi Maubl.), canker, pod rot, wilt. West Indies.
Rosellinia bunodes (Berk. & Br.) Sacc., root rot. P. R.
Spicaria colorans De Jonge, on branches. P. R.

THESPESIA (MALVACEAE)

THESPESIA spp., especially T. POPULNEA (L.) Soland., PORTIA-TREE. Small tropical tree sometimes grown for ornament and wood in S. Fla. and West Indies.

Lophodermium sp., on leaves. T. H.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

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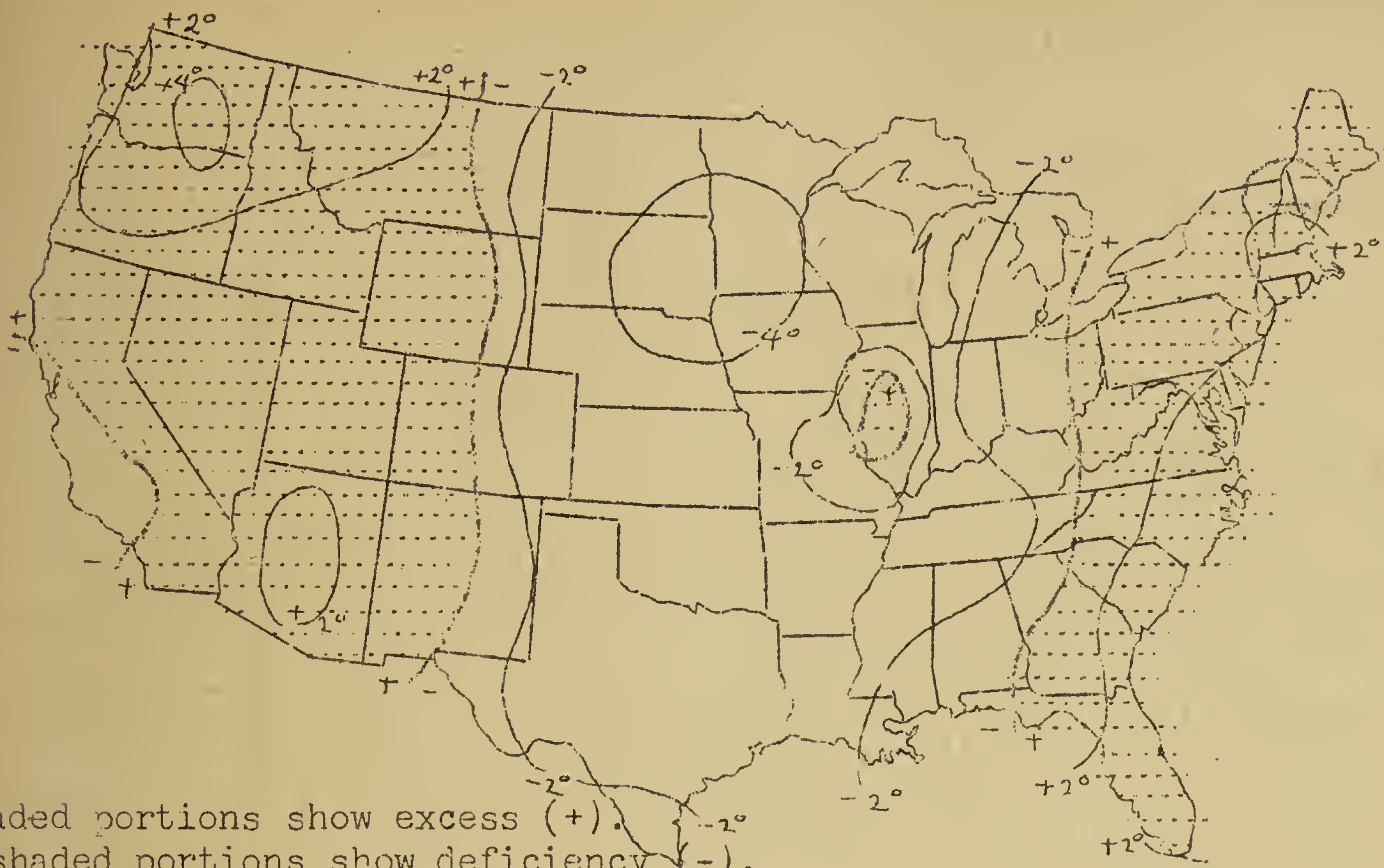
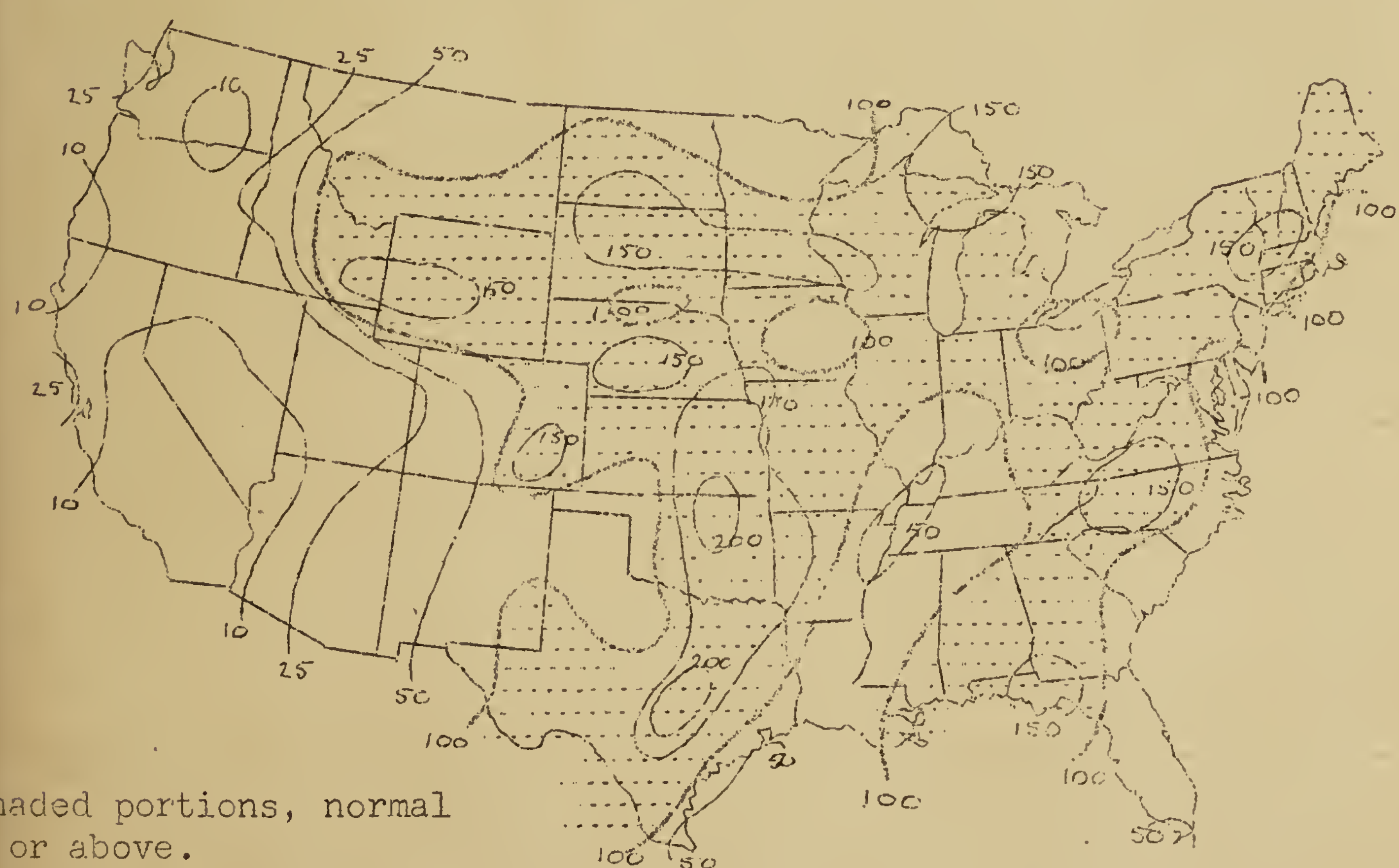
* This species has been bandied between Camellia and Thea for some time, current usage favoring the former. In the preparation of this list Camellia was passed in alphabetic sequence before this disposition was confirmed, therefore the species is introduced under Thea but will be placed in Camellia in the next revision.



Shaded portions show excess (+).
Unshaded portions show deficiency (-).
Lines show amount of excess or deficiency.

Fig. 1. -- Departure of Mean Temperature from the Normal for September 1942



Shaded portions, normal or above.
Unshaded portions, below normal.
Lines show percentage of normal.

Fig. 2. -- Percentage of Normal Precipitation for September 1942

SEPTEMBER WEATHER

(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin for week ending October 6, 1942).

For the country as a whole unusual temperature conditions were experienced during September. The first half of the month was rather uniformly warm, but the latter part brought abnormally cold weather to nearly all sections east of the Rocky Mountains. Record-breaking low temperatures for the season were experienced in a considerable north-central area, with unprecedented snowfall. Figure 1 shows that the monthly mean temperatures were above normal in the more eastern States, despite the relatively cold weather the latter part of the month. However, between the Appalachian and Rocky Mountains, except very locally, the temperatures averaged below normal, with the greatest minus departures in the Southwest and Central-Northern States. West of the Rocky Mountains the range was from near normal in the Great Basin and south Pacific districts to considerably above normal in the interior of the Pacific Northwest, with some record-breaking high temperatures the latter part of the month, coincident with the abnormally cold weather in the East.

Precipitation was decidedly variable for a fall month, the amounts being extremely heavy in some areas and very light in others nearby. Figure 2 shows the geographic distribution in percentages of normal. As an example of the marked variations it will be noted that the monthly totals were relatively light along the Atlantic coast and heavy inland; also, they were light in the immediate central and lower Mississippi Valley and extremely heavy in a south-north belt to the westward extending from eastern Texas northward to southeastern Nebraska. There were also some marked variations in western sections, such as 70 percent of normal at Denver, Colo., and more than twice the normal at Pueblo, nearby. West of the Rocky Mountains moisture was generally scanty with large areas having no precipitation.

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6
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THE PLANT DISEASE REPORTER

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IN THIS ISSUE

CHECK LIST REVISION

Freeman Weiss

THUJA (PINACEAE -- CUPRESSINEAE)

THUJA OCCIDENTALIS L., AMERICAN (Eastern) ARBORVITAE (Northern white-cedar). Evergreen tree of Growth Regions 22, 23, 24, 26, 27; cult. for ornament in numerous (mostly dwarf) horticultural forms, Zone II.

Armillaria mellea Vahl ex Fr., root rot. Mich., N. Y., Texas.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Didymascella thujina (Durand) Maire (Keithia thujina Durand), leaf blight, seedling blight. Vt. to Va. & Wis.
Fomes annosus (Fr.) Cke., brown butt rot. Mich.
F. roseus (Alb. & Schw. ex Fr.) Cke., brown trunk rot. Me.
Fusarium solani (Mart.) App. & Wr., seedling root rot. Texas.
Lenzites saepiaria Wulf. ex Fr., wood rot. Minn.
Lophodermium thuyae Davis, needle spot. Me., N. H., N. Y., Wis.
Micropera tenella Sacc. & Ell., on branches. N. J.
Mycosphaerella sp., ? twig blight. Ala., Pa.
M. conigena (Pk.) House, on twigs & cones. N. Y.
M. pinsapo (Thüm.) House, on twigs. N. Y.
Pestalotia funerea Desm., twig blight. Widespread.
Phacidium infestans Karst., snow blight. N.E. States.
Phomopsis juniperovora Hahn, nursery blight. Ind., Ky., Ohio, Pa., Va.
P. occulta Trav., on injured twigs. N. Y.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on dead branches. Ga., Pa.
Phytophthora sp., twig blight. N. J.
Polyporus spp., wood rot. Spp. reported include P. adustus Willd. ex Fr., Minn., Pa.; P. balsameus Pk., brown butt rot, Great Lakes States; P. hirsutus Wulf. ex Fr., Me.; P. schweinitzii Fr., brown root & butt rot, N.E. States; P. versicolor L. ex Fr., Me.
Poria vaporaria Fr., brown cubical rot. Great Lakes States.
P. weirii Murr., yellow ring rot. Great Lakes States.
Rhizoctonia solani Kühn, damping off. Conn.
Schizophyllum commune Fr., wood rot. Me.
Trametes isabellina Fr., wood rot. Mich.
Valsa thujae Pk., on dead branches. N. Y.

THUJA ORIENTALIS L., ORIENTAL ARBORVITAE. Evergreen tree of E. Asia, cult. in numerous horticultural forms, Zone V-VI.

Alternaria sp., dieback (probably secondary). Texas. Arborvitae grown in nursery and ornamental plantings is subject to physiological dieback resulting chiefly from drought; various secondary

THUJA ORIENTALIS cont.
fungi are associated but have not been shown to be parasitic.
Armillaria mellea Vahl ex Fr., root rot. Miss., Texas.
Beltrania rhombica Penz., dieback. Fla. See note under Alternaria.
Botrytis cinerea Pers., gray mold twig blight. N. J.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Coryneum berckmanii Milbrath, twig blight. Oregon, Wash. Chiefly on the yellow var. Berckmann.
C. cardinale Wagener, twig canker. Calif.
Didymascella thujina (Durand) Maire, leaf blight. Texas.
Diplodia sp., dieback. Ala., Fla. See note under Alternaria.
Pestalotia funerea Desm., dieback. Widespread.
Phomopsis juniperovora Hahn, nursery blight. Pa.
P. occulta Trav., dieback. Miss., N. J., S. Car., Texas. See note under Alternaria.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Rhizoctonia solani Kühn, damping off. N. H., N. Y., Texas, Va.
Valsa abietis Fr., on twigs. Pa.

THUJA PLICATA D. Don, GIANT ARBORVITAE (Western red-cedar). Evergreen tree of Growth Regions 1, 2, 4, 6, 7, 12; important source of lumber.

Aleurodiscus amorphus (Pers. ex Fr.) Rabh., on bark of suppressed or injured trees. Oregon.
Armillaria mellea Vahl ex Fr., root rot, butt rot. Widespread.
Coryneum spp., twig blight. Idaho, Oregon, Wash. Spp. reported include C. juniperinum Ell. and C. thujinum Dearn.
Cucurbidothis conjuncta Petr., on branches. Idaho.
Didymascella thujina (Durand) Maire (Keithia thujina Durand), leaf blight. Mont. to Wash. & Calif.
Echinodontium tinctorium (Ell.) Ell. & Ev., brown stringy rot. Idaho.
Fomes annosus (Fr.) Cke., brown butt rot. Idaho.
F. applanatus (Pers. ex Fr.) Gill., white mottled butt rot. Wash.
F. nigrolimitatus (Romell) Egel., white pocket rot chiefly of slash. Idaho.
F. pini (Brot. ex Fr.) Karst., red ring rot. N.W. States.
F. pinicola (Sw. ex Fr.) Cke., brown trunk rot. Wash.
F. subroseus (Weir) Overh., brown cubical rot. N.W. States.
Hendersonia thyoides Cke. & Ell., twig blight. Oregon.
Herpotrichia nigra Hartig, snow blight. Idaho.
Lenzites saepiaria Wulf. ex Fr. and L. trabea Pers. ex Fr., wood rot. Cosmopolitan.
Microthyrium thujae Dearn., on leaves. Oregon.
Mycosphaerella thujae Petr., on leaves. Idaho.
Pestalotia funerea Desm., dieback. Wash.
Polyporus spp., wood rot. Spp. reported include P. abietinus Dicks. ex Fr., sapwood rot, Idaho, Wash.; P. adustus Willd. ex Fr., Idaho; P. anceps Pk., red ray rot, Idaho; P. cuneatus (Murr.)

THUJA PLICATA cont.
Buchanan, sapwood rot, N.W. States; P. dichrous Fr., Idaho, Mont., Wash.; P. elegans Bull. ex Fr., Idaho; P. guttulatus Pk., Idaho; P. hirsutus Wulf. ex Fr., Idaho; P. schweinitzii Fr., brown root and butt rot, Idaho, Wash.; P. versicolor L. ex Fr., sapwood rot, Idaho, Wash.
Poria weirii Murr., yellow ring rot. General.
Stereum spp., wood rot.
S. chailletii Pers. ex Fr., Idaho.
S. sanguinolentum Alb. & Schw. ex Fr., Mont.
S. sulcatum Burt, Alaska.
Thelephora terrestris Ehr. ex Fr., seedling stem girdle. Wash.
Trametes isabellina Fr., wood rot. Calif., Idaho.
Valsa abietis Fr., and V. weirii Petr., on dead branches. Idaho, Wash.

THUJOPSIS (PINACEAE -- CUPRESSINEAE)

THUJOPSIS DOLABRATA (L. f.) Sieb. & Zucc., HIBA ARBORVITAE. Evergreen tree of Japan, cult. for ornament, Zone VI.

Phomopsis occulta Trav., dieback. Calif.

THURBERIA (MALVACEAE)

THURBERIA TRILOBA (DC.) Tidest., ARIZONA WILD COTTON. Shrub of Growth Regions 10, 11, 14, sometimes grown for ornament in the Southwest.

Diplodia theobromae (Pat.) Nowell (D. natalensis Pole-Evans), dieback. Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Phytomonas malvacearum (EFS.) Bergey et al., angular leaf spot. Ariz.

TIBOUCHINA (MELASTOMACEAE)

TIBOUCHINA spp., GLORYBUSH. Shrubs of S. America, grown for ornament in the far South.

Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.

TILIA (TILIACEAE)

TILIA AMERICANA L., AMERICAN LINDEN, (BASSWOOD). Forest tree of Growth Regions 20, 21, 22, 23, 24, 25, 26, 27; grown for shade and ornament, Zone II; valuable honey plant. A few records on closely related host spp. occurring mostly in the South and often not specifically distinguished are included

TILIA AMERICANA cont.

Aleurodiscus acerinus (Pers. ex Fr.) Höhn. & Litsch., and
A. griseo-canus (Bres.) Höhn. & Litsch., on bark, ? canker.
Pa., Iowa, Mo.
Asteroma tiliae Rud., on leaves. Ind., Wis.
Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches.
Md., N. J., N. Y.
Cercospora microsora Sacc., leaf blight. General. (? Conidial
stage of Mycosphaerella microsora Syd.)
Collybia velutipes Fr., sapwood rot, wound rot. Occasional.
Daedalea confragosa Bolt. ex Fr., white spongy rot, wound rot. Vt.
D. unicolor Bull. ex Fr., Iowa, N. Dak.
Daldinia concentrica (Bolt.) Ces. & DeNot., wood rot. Minn., N. Y.
D. grande Child and D. occidentale Child. Minn.
Dendrophoma tiliae Pk., on branches. N. Y.
Diaporthe eres Nits. (D. velata Pers. ex Nits.), on branches. Mich.
D. tiliacea (Ell.) Höhn., on branches. Iowa, Me., Mich., N. Y., Pa.
Exosporium tiliae Lk. ex Fr., on branches. N. Y. to Va. and Mich.
Fomes applanatus (Pers. ex Fr.) Gill., white butt and heart rot. Vt.
F. connatus (Weinm. ex Fr.) Gill., white spongy rot. N.E. States.
F. pinicola (Sw. ex Fr.) Cke., brown cubical rot. N. Y.
Gnomonia tiliae Kleb. (Gloeosporium tiliae Oud.), leaf spot.
Conn. to Va., Iowa & Minn.
Hydnum septentrionale Fr., white spongy rot. Ala., Mich.
Lenzites betulina L. ex Fr., wood rot. N. Y., Vt.
Macrophoma tiliacea Pk., on branches. Ohio.
Melanconis juglandis (Ell. & Ev.) Graves var. tiliae Wehmeyer,
on branches. Mich.
M. tiliacea (Ell.) Ell. & Ev.: Diaporthe tiliacea.
Microsphaera alni DC. ex Wint., powdery mildew. Minn.
Myxosporium fumosum Ell. & Ev., on dead twigs. Ill.
M. tiliae Dearn. N. Y. (Possibly identical with Myxofusicoccum
tiliae Died., and related to Diaporthe tiliacea.)
Nectria spp. (N. coccinea Pers. ex Fr., N. galligena Bres.), trunk
and branch canker. N. Y., Pa., Va.
N. cinnabarina Tode ex Fr., on branches, dieback. Widespread.
Phlyctaena tiliae Dearn., leaf spot. Tenn.
Pholiota adiposa Fr., brown mottled heart rot. Mass., Pa. to Tenn.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Southern States.
Phyllactinia corylea DC. ex Karst., powdery mildew. Minn.
Phyllosticta praetervisa Bubak, leaf spot. Wis.
P. tiliae Sacc. & Speg., N. Y. to W. Va.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. N. Y., Va.
Pleurotus ostreatus Fr. and P. sapidus Kalch., sapwood rot, sometimes
on living trees. Cosmopolitan.
Polyporus spp., wood rot chiefly of dead trunks, sometimes heart
rot of living trees. Spp. reported include P. adustus Willd.
ex Fr., Minn., Mo., N. Y., Vt., Wis.; P. biformis Klotzsch,
N. Y.; P. elegans Bull. ex Fr., Mo., Ohio, N. Y.; P. fumosus
Pers. ex Fr., N. Y.; P. galactinus Berk., Minn.; P. gilvus Schw.

TILIA AMERICANA cont.
ex Fr.; P. hirsutus Wulf. ex Fr., Mass., N. Y., Vt.; P. pargamenus Fr., N. Y., Vt.; P. resinosus Schrad. ex Fr., Minn., N. Y., Vt.; P. spumeus Sow. ex Fr., N. Y.; P. squamosus Huds. ex Fr.; P. unitus Pers., Mich.; P. versicolor L. ex Fr., Ind., Vt.

Rabenhorstia tiliae Fr., on branches. Iowa, Me., N. Car. Conidial stage of Hercospora tiliae.

Russula sp., parasitic mycorrhiza. Mich.

Schizophyllum commune Fr., wood rot. Minn.

Sclerotinia tiliae Reade, on fallen fruits. Iowa.

Septobasidium fumigatum Burt, felt. Fla.

Stereum spp., wood rot chiefly logs and slash, including S. cinerascens (Schw.) Massee, Iowa, Minn.; S. fasciatum Schw. ex Fr., Vt.; S. murrayi (Berk. & Curt.) Burt, Pa.

Strumella sp. (S. coryneoidea Sacc. & Wint.?), trunk canker. N. J.

Torula ligniperda (Willk.) Sacc., gray sapwood stain.

Trametes mollis Sommerf. ex Fr., wood rot. Vt.

Uncinula clintonii Pk., powdery mildew. General.

Ustulina vulgaris Tul., root rot. N. Y.

Verticillium albo-atrum Reinke & Berth., wilt. Ill.

TILIA CORDATA Mill. (also in part T. EUROPEA L. = T. CORDATA x T. PLATYPHYLLOS Scop.), EUROPEAN LINDEN. Large tree of Europe, extensively planted for shade, Zone III.

Cercospora microsora Sacc., leaf spot. N. J.

Gloeosporium tiliae Oud., leaf spot. N. Y. Conidial stage of Gnomonia tiliae.

TRACHELOSPERMUM (APOCYNACEAE)

TRACHELOSPERMUM JASMINOIDES Lem., CONFEDERATE-JASMINE. Evergreen vine of China cult. for ornament in the far South.

Cercospora repens Ell. & Ev., leaf spot. La.

TRICHILIA (MELIACEAE)

TRICHILIA spp. Small trees of tropical America, sometimes planted for ornament.

Uredo trichiliae Arth., rust II. P. R.

TSUGA (PINACEAE)

TSUGA CANADENSIS (L.) Carr., CANADA or EASTERN HEMLOCK. Evergreen forest tree of Growth Regions 22, 23, 24, 25, 27, 28; source of lumber and tan bark, and grown for ornament in numerous hort. forms, Zone IV.

TSUGA CANADENSIS cont.

Aleurodiscus amorphus (Pers. ex Fr.) Rabh. and A. farlowii Burt, on branches & trunks of suppressed trees. N.E. States.
Armillaria mellea Vahl ex Fr., root & butt rot. Mass. to Pa. & Mich.
Ascochyta conicola Dearn. & House, on cone scales. N. Y.
(Asterina nuda Pk.): Phaeocryptopus nudus (Pk.) Petr. N. Y.
Botrytis sp., twig blight. N. J.
Caliciopsis pinea Pk., on dead bark of sapling, ? bark canker. Pa.
(Cenangium balsameum Pk., and var. abietinum Pk.): Dermatea balsamea (Pk.) Seaver.
Coniophora puteana (Schum. ex Fr.) Karst., sapwood rot chiefly of slash. Widespread.
Cylindrocladium scoparium Morgan, seedling root rot. N. J.
Cytospora sp. (? C. curreyi Sacc.), twig canker. Md., Va.
Dasyscypha agassizii (Berk. & Curt.) Sacc., on branches. N. Y.
Dermatea balsamea (Pk.) Seaver, canker, twig blight. Ga., N. Y., Tenn., Va.
Didymascella tsugae (Farl.) Maire (Keithia t. Farl.), needle blight. Mass., N. H., Wis.
Dimerosporium tsugae Dearn., on needles. Ga., N. Car., Tenn., Va.
Fomes spp., wood rot of living or dead trees and logs, especially:
  F. annosus (Fr.) Cke., white spongy sapwood rot. Conn.
  F. applanatus (Pers. ex Fr.) Gill., white mottled root & butt rot. Occasional.
  F. pini (Brot. ex Fr.) Karst. including var. abietis Karst., red ring rot, white pocket heart rot. N.E. States to Tenn.
  F. pinicola (Sw. ex Fr.) Cke., brown cubical rot of trunks & logs. Widespread.
  F. roseus (Alb. & Schw. ex Fr.) Cke., brown cubical trunk rot. Me. to W. Va.
  F. subroseus (Weir) Overh., brown cubical rot of logs & timber. N. Y., Pa., Va.
Ganoderma lucidum (Leyss. ex Fr.) Karst. (G. tsugae Murr.), white spongy sapwood & heart rot. N.E. States to Ind. & Wis.
Gelatinosporium abietinum Pk. Conidial stage of Dermatea balsamea.
Hymenochaete agglutinans Ell., stem girdle of saplings. Pa.
Lenzites betulina L. ex Fr., white sapwood rot. N. Y.
  L. saepiaria Wulf. ex Fr., and L. trabea Pers. ex Fr., brown cubical rot of logs & timber. Widespread.
Melampsora abietis-canadensis Ludwig, needle & cone rust (O, I). New England to Pa. & Wis. II and III on Populus spp.
  M. farlowii (Arth.) Davis, needle & cone rust (III). New England to N. Car. & Wis.
Micropera abietina (Pk.) Höhn. Conidial stage of Dermatea balsamea.
Mycosphaerella tsugae (Pk.) House, on cone scales. N. Y.
Phacidium tsugae Cash & Davidson, on discolored needles. N. Car.
Phomopsis occulta Trav., on blighted twigs. Mass., N. J., N. Y.
Polyporus spp., sapwood rot of standing or fallen trees, sometimes heart rot of living trees, especially:
  P. abietinus Dicks. ex Fr., white sapwood rot. General.

TSUGA CANADENSIS cont.

Polyporus albidus Pk., N. Y.
P. amorphus Fr., brown stringy rot, Pa.
P. anceps Pk., red ray rot, Mass.
P. borealis Fr., brown cubical rot, Mass., N. Y., Tenn., Va.
P. caesius Schrad. ex Fr., Me.
P. cinnabarinus Jacq. ex Fr., Pa., Vt.
P. circinatus Fr., white root & butt rot, N. Y., Wis.
P. dichrous Fr., N. Y.
P. dualis Pk., N. Y.
P. fibrillosus Karst., N. Y., Tenn.
P. fissus Berk., Mich.
P. fragilis Fr., N. Y.
P. gilvus (Schw.) Fr., Pa.
P. guttulatus Pk., N. Y.
P. hirsutus Wulf. ex Fr., N. Y.
P. prolificans Fr., N. Y., Pa.
P. resinosus Schrad. ex Fr., Me., Tenn., Vt.
P. spraguei Berk. & Curt., N. Y.
P. spumeus Sow. ex Fr., Me.
P. subpendulus (Atk.) Sacc. & Trott., N. Y.
P. sulphureus Bull. ex Fr.
P. tulipiferus (Schw.) Overh., Vt.
P. undosus Pk., N. Y.
P. versicolor L. ex Fr., Widespread.

Poria spp., wood rot usually of dead trunks, logs or timber, especially P. ferruginosa Schrad. ex Fr., white spongy rot; P. incrassata (Berk. & Curt.) Burt, dry rot of timber, widespread; P. isabellina (Fr.) Overh., white pocket rot, N. Y.; P. subacida (Pk.) Sacc., white spongy rot, N.E. States; P. tsugina (Murr.) Sacc. & Trott., white spongy rot, N.E. States to Tenn.; P. vaillantii (Fr.) Cke., dry rot of timber, widespread.

Pucciniastrum hydrangeae (Berk. & Curt.) Arth., needle rust (O, I). Ind., Md., Pa., Tenn., Va. II & III on Hydrangea arborescens.
P. myrtilli (Schum.) Arth., needle rust (O, I). Me. to Ala., Ind. & Wis. II & III on Ericaceae.

Rhizina undulata Fr., seedling root rot. N. Y.

Rhizoctonia solani Kühn, damping off. Cosmopolitan.

Rosellinia herpotrichioides Hepting & Davidson, needle blight. N. Car.

Stereum spp., rot of logs, slash & timber, especially: S. radiatum Pk., Pa., Va., Wis.; S. sanguinolentum Alb. & Schw. ex Fr., brown cubical sapwood & heart rot, widespread; S. sulcatum Burt, Pa., Vt., Wis.

Trametes spp., rot of logs & slash, sometimes of timber, especially: T. americana Overh., Me., Wis.; T. carbonaria (Berk. & Curt.) Overh., N. Y., Pa.; T. heteromorpha (Fr.) Lloyd, Me., N. Y., Va.; T. sepium Berk., N. Y.; T. serialis Fr., Me., N. Y.

Valsa abietis Fr., on branches., Va., W. Va.

TSUGA CAROLINIANA Engelm., CAROLINA HEMLOCK. Evergreen tree of Growth Region 27; grown for ornament. Zones V-VI.

Dimerosporium tsugae Dearn., on discolored needles. N. Car.
Melampsora abietis-canadensis (Farl.) Ludwig, needle & cone rust (O, I). Conn.
M. farlowii (Arth.) Davis, needle & cone rust (III). N. Car. (Less susceptible than T. canadensis).
Pucciniastrum myrtilli (Schum.) Arth., needle rust (O, I). N. Car.

TSUGA HETEROPHYLLA (Raf.) Sarg., WESTERN HEMLOCK. Large forest tree of Growth Regions 1, 2, 4, 6, 12; important source of lumber.

Arceuthobium campylopodum Engelm. forma tsugensis (Rosendahl) Gill, dwarf mistletoe. Mont. to Oregon and Alaska.
Armillaria mellea Vahl ex Fr., root rot. Oregon, Wash.
Botrytis cinerea Pers., seedling twig blight. Idaho.
Caeoma dubium Ludwig, needle rust (O, I). Idaho, Mont., Oregon, Wash.
Ceratostomella sp., blue stain. Oregon, Wash.
Coniophora puteana (Schum. ex Fr.) Karst., dry rot of timber. Idaho, Wash.
Didymascella tsugae (Farl.) Maire, leaf blight. Alaska.
Dimerosporium tsugae Dearn., on discolored needles. Alaska, Oregon, Wash.
Echinodontium tinctorium (Ell.) Ell. & Ev., brown stringy heart rot. General.
Fomes annosus (Fr.) Cke., butt rot, white pocket heart rot. Idaho, Oregon, Wash.
F. applanatus (Pers. ex Fr.) Gill., white mottled butt & heart rot. Oregon, Wash.
F. officinalis (Vill. ex Fr.) Faull, brown cubical rot. Oregon, Wash.
F. pini (Brot. ex Fr.) Karst., red ring rot. General.
F. pinicola (Sw. ex Fr.) Cke., brown cubical rot. General.
F. robustus Karst. (F. hartigii Allesch.), white spongy rot. Oregon, Wash.
F. subroseus (Weir) Overh., yellow-brown trunk rot. N.W. States.
Ganoderma oregonense Murr., white spongy rot. Oregon.
Hydnum abietis Hubert, long pocket rot. Oregon, Wash.
Lenzites saepiaria Wulf. ex Fr., brown cubical rot of logs & timber. Idaho, Wash.
Pholiota adiposa Fr., brown mottled butt rot. Idaho.
Polyporus spp., rot of standing or fallen trees, sometimes heart rot of living trees, especially:
P. abietinus Dicks. ex Fr., sapwood rot, general.
P. alboluteus Ell. & Ev., Idaho.
P. amorphus Fr., Idaho, Oregon.
P. borealis Fr., Mont.

TSUGA HETEROPHYLLA cont.

Polyporus caesius Schrad. ex Fr., Idaho.
P. circinatus Fr., white root & butt rot. Idaho.
P. dryadeus Pers. ex Fr., white root and butt rot, Mont. to Oregon & Wash.
P. fibrillosus Karst., Idaho.
P. guttulatus Pk., Idaho.
P. lapponicus Romell, Idaho.
P. melanopus Fr., Idaho.
P. resinosus Schrad. ex Fr., Wash.
P. schweinitzii Fr., red-brown butt & heart rot, Idaho, Oregon, Wash.
P. sulphureus Bull. ex Fr., brown cubical heart rot, Oregon, Wash.
P. versicolor L. ex Fr., general.
P. volvatus Pk., Wash.
Poria spp., rot chiefly of fallen trees & slash, especially:
P. colorea Englerth, yellow root rot, Oregon, Wash.; P. isabellina (Fr.) Overh., white pocket rot, Alaska, Idaho; P. subacida (Pk.) Sacc., white spongy root rot, Oregon, Wash.; P. tsugina (Murr.) Sacc. & Trott., white spongy rot, Idaho, Wash.
Rhizina undulata Fr., seedling root rot. Idaho.
Schizophyllum commune Fr., wood rot. Calif.
Stereum spp., white pocket rot of logs & slash, especially:
S. chailletii Pers. ex Fr., S. sanguinolentum Alb. & Schw. ex Fr., S. sulcatum Burt., Pacific Northwest.
Thelephora caryophyllea Schaeff. ex Fr., on seedlings. Idaho.
Trametes serialis Fr., rot of logs & timber. Idaho, Wash.
Uraecium holwayi Arth., needle rust (O, I). Alaska, Idaho, Mont., Oregon, Wash.

TSUGA MERTENSIANA (Bong.) Carr., MOUNTAIN HEMLOCK. Evergreen tree of Growth Regions 4 & 12.

Arceuthobium campylopodum Engelm. forma tsugensis (Rosendahl) Gill, dwarf mistletoe. Idaho, Wash.
Dasyscypha arida (Phill.) Sacc., on branches. Idaho.
Echinodontium tinctorium (Ell.) Ell. & Ev., brown stringy rot. Pacific Northwest.
Fomes nigrolimitatus (Romell) Egel., white pocket rot. Oregon.
F. officinalis (Vill. ex Fr.) Faull, brown cubical rot. Idaho.
F. pini (Brot. ex Fr.) Karst., red ring rot. Idaho, Oregon.
F. pinicola (Sw. ex Fr.) Cke., brown trunk rot. Widespread.
Ganoderma oregonense Murr., white spongy rot. Idaho.
Herpotrichia nigra Hartig, snow blight. Mont. to Oregon & Alaska.
Polyporus dryadeus Pers. ex Fr., white root & butt rot. Mont. to Oregon & Wash.
P. schweinitzii Fr., red-brown butt rot. Mont., Oregon.
Stereum sanguinolentum Alb. & Schw. ex Fr., and S. sulcatum Burt., white pocket rot. Idaho, Mont., Wash.
Uraecium holwayi Arth., needle rust (O, I). Idaho, Mont.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

SOYBEAN DISEASES IN IOWA IN 1942

I. E. Melhus

Several diseases of soybeans were unusually destructive in Iowa in 1942. Bacterial blight, caused by Pseudomonas glycineum [Phytomonas], was prevalent and destructive throughout the state. The amount of damage varied although no fields were found that were free from the disease. Midwest (McClave) was the most susceptible variety in Iowa this year but no variety showed any marked degree of resistance. The pod blight stage of the disease was severe, and the reduction in yield in different fields varied from 2 to 10 percent.

The mosaic diseases were severe in nearly every field. Field varieties usually showed the yellow mottling and stunting symptoms, and occasionally the dark green rugose symptoms so common in the vegetable soybeans were observed. Judging from the number of plants showing late, mild symptoms a considerable amount of spread must have occurred during the season. Probabilities are that seed infection will be more prevalent than in former years. The damage to the crop varied from 1 to 5 percent.

Downy mildew, caused by Peronospora manshurica, appeared in Iowa this summer for the first time. It was found in southeast Iowa on August 21. At that time the disease was general and severe in many fields. Apparently it spread rapidly over the entire state in a manner characteristic of the Peronosporaceae. The leaf injury in some fields was general and severe, but in others little injury occurred. In late planted soybeans from 15 to 50 percent of the leaf surface of the younger, functional leaves were yellowed or killed by the mildew. Soybeans in early planted fields showed little or no disease. There was no evidence of pod infection. Oospores occurred in the leaves which, unfortunately, insures the establishment of the pathogen in our soils. The fact that a Peronospora has established itself in the Upper Mississippi Valley this year is, of course, an expected incident, but nevertheless it means another crop hazard.

Anthracnose (caused by Colletotrichum glycines) and pod and stem blight (caused by Diaporthe sojae) appeared near the middle of August. Those organisms were abundant by the end of September when killing frosts occurred, but it is difficult to assess the amount of damage they produced. In general, they were found on branches or weak plants that were shaded under the very rank growth of the healthy soybean plants. In nearly every case the affected branch or plant was on the ground. The non-branching upright types were relatively free of both diseases. The usual type of pod and stem blight was rather uncommon this year. Abundant seed infection undoubtedly will occur as both organisms were found on diseased pods.

A new and destructive disease tentatively described as bud blight was present in the majority of fields. The infected plants were dwarfed in

the apical regions; the tip of the stem was curled and brown; the upper 2 or 3 leaves were dwarfed and frequently covered with small necrotic lesions; the whole curled, dwarfed tip was usually hidden by two abnormally large, dark green, stiff, rough leaves; and the pulvinus of most of the leaves showed a dark brown, water-soaked appearance. Few if any pods were set on the severely infected plants.
(FROM MIMEOGRAPHED LEAFLET NO. 6, WAR SERVICE COMMITTEE UPPER MISSISSIPPI VALLEY PLANT PATHOLOGISTS. OCTOBER 2, 1942).

TOBACCO DISEASES IN VIRGINIA IN 1942

S. B. Fenne

Downy mildew or blue mold [Peronospora tabacina] was not of much consequence during the past season. It appeared in the State rather late in May, finally appearing generally throughout the entire eastern tobacco belt. Control measures were not necessary.

Mosaic [virus] of tobacco was more prevalent this year than it has been in the past 10 years. Numerous fields were visited where practically every plant was diseased. In many cases severe stunting occurred and the quality and yield of leaf were undoubtedly very much reduced. In some cases sun scorch followed after severe mosaic infection.

Ring spot [virus] was observed very generally in the dark, sun-cured, and air-cured tobacco areas of the State, with more than usual in the flue-cured area. Some fields were observed in the dark tobacco area with 100% infection. In many cases ring spot was associated with black root rot and the resulting injury was probably more severe than would have been caused by ring spot alone. Several farmers were very much concerned about the damage caused by ring spot. The leaves were much narrower than normal and the diseased plants in general were considerably stunted. As in former years ring spot appeared to be more severe in fields adjacent to clover or lespedeza. One of the common practices in the dark tobacco area is to follow a strip-cropping program in which tobacco is planted in alternate strips with legumes. This has resulted in much more ring spot in those areas than in former years.

Brown spot was responsible for severe damage late in the season. In some cases about 3/4 of the tobacco had been harvested when heavy rains appeared and brown spot developed rapidly causing severe "firing" in many cases. Since brown spot appeared late in the season the loss sustained was not as great as it has been occasionally in former years.

Frenching [non-parasitic] was reported more frequently this year than usual, probably because of the extremely wet season in some areas. In one case a typical specimen of "frenching" was sent in to this office from Charlotte County. Ten days later when the extension pathologist visited this farm there was little evidence of frenching found in the field; complete recovery apparently had occurred. The only evidence remaining was that many of the leaves throughout the field were rather

narrow. Except for this minor symptom the plants had recovered completely.

Black root rot [Thielaviopsis basicola] is apparently very generally distributed throughout the whole tobacco area in Virginia. The use of a resistant Burley type, such as "Kentucky 16", and a resistant flue-cured type, such as "Yellow Special", has been very successful wherever employed. No dark, sun-cured, or air-cured varieties resistant to black root rot are available. Many tobacco fields were visited in each of the tobacco belts where black root rot was obviously causing considerable injury. In a number of cases when the soil warmed up and permitted secondary roots to develop considerable recovery occurred. Frequently black root rot was associated with ring spot and mosaic.

Granville wilt [Phytomonas solanacearum] appeared to be somewhat on the increase during the past season. This was especially true in Mecklenburg County and possibly in Halifax and Nottoway Counties. It appears that the wet weather in the middle and latter part of the season was very favorable to the development of Granville wilt.

Black shank [Phytophthora parasitica var. nicotianae] spread to a few additional farms in Halifax and Pittsylvania Counties; however the damage caused by this disease in previously established fields was less serious than expected. In one field observed in Pittsylvania County, where tobacco was severely diseased with black shank in 1941, the farmer omitted the area where the plants had died the previous year and planted tobacco in the rest of the field, completely surrounding the infested spot. It was naturally expected that he would suffer a severe loss, owing to dissemination of the black shank pathogen by plows, cultivators, and other farm implements. This, however, was not the case; black shank was only scattered throughout the field, causing only 10 or 15% loss of plants in that field.

Root knot [Heterodera marioni] was observed in a number of additional areas throughout the State during the past season. It is doubtful that this disease has spread very much; however, new locations are being found which probably have been present for a number of years but not reported. Root knot is not considered to be a very serious tobacco disease except in the few far eastern tobacco counties with light sandy soil. Root knot has become a very serious problem in Caroline County where sweet potatoes are intensively grown. In that county it has been found necessary to practice careful crop rotations on infested farms.

Sore shin [Rhizoctonia solani] was probably more prevalent during the past season than usual. A trace could be found in practically every field visited and in some instances as many as 3% of the plants were found to be killed.

Sclerotium wilt [S. rolfsii] was observed in several instances in the far eastern counties especially where peanuts and soybeans had been grown

in the rotation. In a few cases spots were found where 20 or 30 tobacco plants had been killed. Generally sclerotium wilt is not considered to be a very serious disease of tobacco.
(EXTENSION PLANT PATHOLOGIST).

DISEASES OF BRIGHT TOBACCO IN PITTSYLVANIA COUNTY, VIRGINIA, DURING THE 1942 SEASON

Wilbert A. Jenkins

Downy mildew or blue mold (Peronospora tabacina) was not a problem during the past season although its presence in the county was reported several times during the month of May, with the earliest confirmed record being taken on May 6. Later, however, blue mold appeared generally throughout the section; but many growers had essentially finished their field planting when it appeared in their beds, and in no instance was it necessary to institute control measures in addition to the removal of the plant-bed covers. Prevailing weather conditions otherwise held the disease in check.

Black leg (Erwinia aroideae) caused more or less severe damage to several plant beds in the northeastern portion of the county. Only one of the affected beds was seen but specimens were received from several others. The bed seen was on new ground, rather densely shaded, and the plants had been unduly forced by over-fertilization and overwatering. Bed rot was severe, fully 50% of the seedlings being affected. Two weeks after taking appropriate steps to dry out the bed, apparently healthy plants were transplanted to the field. No further development of the disease was noted in the field.

Cultures were made and inoculations on seedlings produced typical symptoms within 3 days under conditions of extremely high humidity in the greenhouse. It was suspected that the disease followed a mild outbreak of downy mildew, but this was not confirmed.

Black shank (Phytophthora parasitica var. nicotianae) continued to spread in the southwestern portion of the county, although it is still apparently confined within an area of a 10- to 15-mile radius. On farms where it has been present for some time, the disease appears to reach its peak during the third season following its initial appearance. Evidence indicates that the field incubation period may require 2 full seasons if the inoculum is introduced by any other means than on infected seedlings.

Black shank is known to be present on 10 different farms in Pittsylvania County. Of this number, 5 were discovered in 1941 and 5 during the past season. The infestations on 3 of these farms represent the disease in its second year, but in only 1 was the disease seen during the first season

it appeared on the farm. The infestations on the other 7 farms have been present in destructive form for at least 3 seasons. All the evidence indicates that these latter farms were infested by diseased seedlings brought into the county from States further south during the downy mildew epiphytotic of 1937-1938.

Losses have ranged from 1% to 90% in individual fields, depending on the length of time the disease was present and on certain other factors about which little is known as yet. During the past season losses ranged from 1% to 15% in individual fields. The losses sustained in 1942 remained as low as they did because the growers avoided planting tobacco on the heavily infested sites.

Granville wilt (Phytomonas solanacearum) is more widespread in Pittsylvania County than black shank. We have had numerous but, as yet, unconfirmed reports of its presence, particularly from the extreme northeastern section of the county. However, since the greater number of our confirmed locations are in that area, it is doubtless heavily infested. We have also identified the disease in the southeastern and western areas of the county during the past season, but as yet the number of infestations are few. It appears that Granville wilt is spreading more rapidly in this county than black shank, particularly as regards its entrance into new localities.

It also appears that newly cleared land is potentially more dangerous than older land and that fields alongside drainage channels are particularly liable to early infestation. Our limited evidence indicates that this is probably not altogether due to contaminated drainage. We have also secured some evidence that newly cleared pine land is more often better correlated with severe Granville wilt infestation during the first crop season than is land cleared from oak.

The severity of losses from Granville wilt during the past season was about the same as for black shank, but Granville wilt appears to reach its maximum stage of damage earlier in the season. Due to its wider distribution, the total loss during the past season was greater from Granville wilt than from black shank.

Root knot (Heterodera marioni) is not yet a serious problem generally in Pittsylvania County, although it appears to be on the increase. Serious infestations have developed in the southeastern and deep southwestern portions of the county in recent years. Two farms were located in 1941 and 3 during the 1942 season, in the southern area, on which root knot is the limiting factor in tobacco production. An isolated infestation was also found in the northeastern part of the county.

In a single instance, on very deep soil, a somewhat unusual root knot situation was found. The tobacco had made exceptionally vigorous growth and no marked evidence of root knot appeared until near harvest, when

a high percentage of the plants began to wilt and die rather suddenly. We have attempted to relate this peculiar behavior to such soil peculiarities as depth, fertility, and temperature zones, a combination of which could conceivably have influenced the course of the disease until the crop was almost mature.

Sore shin (Rhizoctonia solani) and sclerotium stem rot (Sclerotium rolfsii) were both present and caused severe damage, particularly the former. The past season, beginning wet and cool and continuing fairly wet, was ideal for development of sore shin in the field. Losses from sore shin were 10% to 20% higher than in normal years and the disease was generally prevalent throughout the county. One field was seen that had been replanted 3 times. The grower was never able to get better than a 30% stand and this came too late to be of any value. In the southeastern portion of the county sore shin was almost as destructive on many fields as we had observed Granville wilt to be elsewhere, 15% to 25% loss in stand not being unusual.

Sclerotium stem rot was limited in its distribution but was highly destructive on certain farms in the central portion of the county. Our observations indicate that, unlike sore shin which varies in intensity from season to season, sclerotium stem rot tends to remain fairly constant season after season, and gradually builds up to the point where tobacco production becomes unprofitable. If true, this might indicate that introduction from the plant bed is a bigger factor in the case of sore shin than in the case of sclerotium stem rot.

Common mosaic and ring spot (virus) have been on the increase in this county for the past several seasons. During the past season it was exceptional to find a crop free from these diseases. It was a common experience to find 20% to 30% pre-harvest infection, and 75% to 100% infection by common mosaic was noted in several fields. Ring spot was generally present along with common mosaic, particularly in fields adjacent to lespedeza.

Black root rot (Thielaviopsis basicola) was reported more often, and more determinations were made, during the past season than during the season before. However, with few exceptions, none of these appeared to be of recent origin. Certain bits of observational data indicate that generalized field infestation may develop slowly, i.e., gradually increase in intensity over a period of years, while typical "spot" infestations may develop fairly suddenly. These latter infestations usually persist almost indefinitely and appear to spread very little.

Black root rot was found generally throughout the county, but was especially prominent in the southwestern and northwestern areas. It has thus far been impracticable to estimate the percentage of infestation of black root rot or the percentage of loss in quality of the affected crop, but we know that both percentages run high annually.

Yellow Special, an exceedingly high quality bright tobacco variety developed by the Virginia Station, continues to produce a maximum yield under our most severe black root rot conditions.

Leaf spots (in part physiological) were severe during the past season. Losses would not be accurately reflected either in the market price or in the poundage sold because of 2 rather unusual circumstances. The market price paid for medium and common quality grades sold was uniformly high so that the growers netted more income from short crops and low quality during the 1942 season than was true the season before on better yields and quality. Losses were otherwise compensated for by an excellent growing season that tended to bring up the total yield, in spite of heavy losses from leaf spot diseases. In other words, a grower might well have lost 10% to 20% of his crop during the past season and still have received a comparable poundage in yield to that of previous seasons when the seasonal conditions were not so favorable.

Our observational data lead us to believe that certain growers lost 20% to 40% of their crop in poundage in certain fields because of leaf spot diseases. For the county as a whole there was a probable loss of 10% to 15% in poundage. Considering all factors, the net loss in acre value, as felt by the growers, was from 5% to 10%.

Under the designation leaf spot diseases, we are placing all leaf spots and tissue break-down which obviously were predominantly correlated with the physiological effects of extremely wet weather on mature or rapidly maturing leaves. Light infections of angular leaf spot [Phytomonas angulata] were seen occasionally. Typical symptoms of potash hunger and sand drown were seen fairly frequently but predominantly only as a unit of the leaf-spot symptom-complex. Uncomplicated symptoms of frenching were not seen during the past season. Numerous fungi (Alternaria in particular) were found on leaf-spot affected leaves, some of them apparently producing fairly uniform lesions, but for the most part they appeared to be feeding on otherwise weakened tissues.
(VIRGINIA AGRICULTURAL EXPERIMENT STATION TOBACCO RESEARCH LABORATORY, CHATHAM).

BRIEF NOTES ON PLANT DISEASES

POTATO LATE BLIGHT SITUATION STILL BAD IN THE UPPER MISSISSIPPI VALLEY: The late blight disease [Phytophthora infestans] of potatoes appearing in typical fashion, has nearly ruined the potato crop over an extensive area. Following the killing of the vines in a few weeks, the tubers began to decay. Some growers tried to rush their potatoes onto the market and met with trouble from the commission houses and wholesalers because of decay. The late blight disease has reduced the Iowa crop by 50 percent. The potato crop in states in the Upper Mississippi Valley has suffered to a similar degree. The only safe course in handling the potatoes now is to delay digging until cool weather and store the tubers at 35°F. or below

in well-ventilated storage. It should be brought to the attention of the seed trade that probably never before has late blight been so general in the Upper Mississippi Valley as it was this year. The affected area extends from Ohio on the east to Colorado on the west. Every agency dealing with potatoes should place special emphasis on the proper storage of all seed and table stock. (From mimeographed leaflet No. 6, War Service Committee Upper Mississippi Valley Plant Pathologists. October 2, 1942).

BEET SCAB IN NEW YORK FIELDS: Beet scab [Actinomyces scabies], during the past season, was severe in a number of fields studied in the Geneva, Stanley, and Benton regions in New York State. In some fields, 100% infection was present. An apparent difference in resistance between beet strains was noted in one planting. Two different strains of Detroit Dark Red were planted in one field. Some 60 rows of a shorter leaf strain were planted in the center of the field and on both sides was planted a longer leaf strain. The shorter leaf strain was affected with practically 100% scab, while the longer leaf strain was free from infection. Since this difference was present in adjacent rows of both strains on each side of the affected shorter leaf strain planting, it appeared that there was a difference in resistance.

These observations will have to be proved by experimental tests before any final statement may be given. (Otto A. Reinking, New York State Agricultural Experiment Station, Geneva. October 16).

A CANKER DISEASE OF CROTALARIA SPECTABILIS IN TEXAS: During dry summer weather in 1941 and 1942, a large number of Crotalaria spectabilis plants at the Tomato Disease Laboratory, Jacksonville, Texas, died apparently from a canker disease on the stem and upper part of the taproot. In some cases a white mold was noted on the cankers near the crown. In the fall of 1942, cultures were made of this material on potato-dextrose agar and in practically all cases Sclerotium [Rhizoctonia] bataticola was obtained. Because of the increasing importance of this legume for soil fertility improvement and root-knot control, further studies of the disease will be made. (P. A. Young, Texas Agricultural Experiment Station, Tomato Disease Laboratory, Jacksonville).

BITTER PIT IN McINTOSH: For many years bitter pit has been known to occur in some varieties of apples produced in Maine. Northern Spy and Baldwin are affected to some degree practically every year. However, bitter pit has never been reported before in McIntosh in Maine. Recently typical symptoms were found on McIntosh grown at Orono after the fruit had been in cellar storage for a short time. In all cases the affected fruit was picked before the normal picking time for McIntosh, either because of necessary fruit thinning to prevent limb breakage, or because of excessive fruit dropping just before normal harvest. The 1942 growing season in the apple-producing region of Maine was characterized by erratic rainfall. During June the precipitation at Orono was 141% when compared with the 40-year average, but the remainder of the growing season was characterized by light rainfall. In July it was only 33%, in August 43%, and in September 71% of the 40-year average. (M. T. Hilborn, Maine Agricultural Experiment Station).

A CORRECTION: On page 370 of the September 1 issue, second paragraph, the name for elm leaf spot should be Gnomonia ulmea, instead of veneta as given.

REQUEST FOR INFORMATION

In this year of peculiar weather conditions there must surely have been many unusual occurrences of plant diseases other than those already given in the Reporter. The Survey would like to have reports giving particular attention to the relation between weather and specific plant disease occurrences.

What has been the further history this year of potato late blight? Response to the earlier request was somewhat disappointing.

There have been numerous reports in the Weekly Weather and Crop Bulletin of tomatoes "blighting and rotting". The late blight fungus was reported on tomatoes in Massachusetts and Virginia; has it been found elsewhere?

Reports on other diseases of both crops would be appreciated.

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
BUREAU OF PLANT INDUSTRY, AGRICULTURAL RESEARCH ADMINISTRATION
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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

FRUIT AND VEGETABLE DISEASES ON THE CHICAGO MARKET IN 1940 AND 1941

G. B. Ramsey

APPLE:

Alternaria rot (Alternaria sp.) is often found on the market in the calyx end of fruit injured by chemicals used in spraying or washing. In 1940 a few lots of Jonathan apples from Washington State showed as high as 10% of this rot following calyx injury.

Bitter pit (physiological). The Gravenstein variety of apples is particularly susceptible to this trouble. Large sizes often show 3 to 4 times as much injury as small fruit. In 1940 Oregon-grown Gravensteins marketed during August sometimes showed 15% bitter pit in the large sizes. During August 1941 Gravensteins from California showed a range of 4 to 35%. Bitter pit was found in Greenings from New York in December, 1941, ranging from 5 to 25%.

Blue mold (Penicillium sp.) was found to some extent in apples from all regions. The higher percentages of decay were usually found in storage apples marketed during late winter and early spring. The highest amount (13%) of blue mold rot was noted in a car of Washington-grown Winesap apples inspected in May, 1940. Idaho-grown Delicious showing calyx injury had 10% blue mold in lots marketed during October.

Chemical injury. Each year occasional lots of apples show some injury caused by chemicals used in spraying or in washing solutions. Calyx injury caused by arsenical burn is most common, but the most conspicuous injury is a brown surface discoloration, frequently involving the whole apple, caused by hot washing solutions. Occasionally as much as 55% of the apples in some boxes are found discolored. However, accidental injuries of this type are rare.

Internal breakdown was of little importance in most of the apples inspected here during 1940 and 1941. The greatest amount of this trouble (25%) was found in a car of Washington apples marketed in March, 1941.

Jonathan Spot. One car of Jonathan apples from Washington marketed in October, 1940 showed a range of 4 to 16%, averaging 7%. In 1941 many Michigan-grown Jonathans marketed in October showed spotting ranging from 5 to 20%. Some of these apples had from 1/4 to 1/2 of the surface discolored.

Rhizopus rot (R. nigricans) is comparatively rare on the market, but occasionally ripe, bruised apples and worm-damaged fruit show this trouble. One lot of Michigan apples marketed in October, 1941 that showed 5% worm damage had 4% of rhizopus rot.

Sporotrichium rot (Sporotrichium sp.). Each year a few lots of apples from Washington and Oregon show traces of this decay. Frequently it is associated with infections by Gloeosporium and Fusarium.

ARTICHOKE (GLOBE):

Gray mold rot (Botrytis sp.) is so far the only market disease of California artichokes that is of economic importance. Small percentages

of this disease occur commonly, but now and then a few boxes may be found showing excessive decay. Delayed shipments or stock held a week or two on the market often show serious decay. In 1941 one lot on inspection showed a range from 20 to 85%, with an average of 45%.

ASPARAGUS:

Bacterial soft rot (Bacterium sp.) affects California asparagus to some extent each year. Usually the tips and cut ends of the shoots are affected. Five to 10% of this decay is not uncommon and occasionally as much as 25% is found. The shipments that are properly precooled seldom develop much of this rot during transit.

Gray mold rot (Botrytis sp.) is not often found on asparagus but occasionally it causes some trouble, such as was found in a car of California stock inspected in March, 1941, showing 20% decay.

Phytophthora rot (Phytophthora sp.). California asparagus received during March and April, 1940 and 1941, showed phytophthora rot affecting as much as 25% in some lots. The infections take place at the soil line and lesions average about 2 inches in length by the time stock reaches the market.

AVOCADO:

Anthracnose (Colletotrichum gloeosporioides) was especially serious in a lot of California fruit inspected in a store in March, 1941. In some boxes the decay ranged to 60%, and the average for the lot was 24%.

Surface rot (Dothoriella gregaria) was found in several lots of California fruit during 1940 and 1941, from December to May. The most extensive decay, 45%, found was in a lot inspected in a store. This spot and rot has been much more prevalent during the last 2 years than in previous seasons. Most lesions are small and superficial on arrival of shipments. Serious development of surface and internal decay occurs while the fruits are held on the market and in stores for ripening.

ANISE:

Watery soft rot (Sclerotinia sclerotiorum) was found in a car of California anise inspected in February, 1940, the decay ranging from 40 to 100%, averaging about 90%. The bulb-like base of the plant was affected as well as the top.

APRICOT:

Rhizopus soft rot (Rhizopus nigricans) occurred in a car of Washington stock inspected in July, 1940. The average for the lot was about 25% but many boxes of ripe fruit showed 80% of this decay.

BEANS:

Anthracnose (Colletotrichum lindemuthianum) was more serious in Florida beans during 1941 than in the previous year. As is often the case truck

shipments showed most decay. In one instance an average of 65% was found in a truck load marketed in January.

Bacterial blight (Phytomonas [Xanthomonas] phaseoli) was present in some lots of Colorado beans marketed during July 1940, about 7% of the pods being spotted. This disease also was found affecting 5% of some lots of Florida beans in April 1941.

Soil rot (Corticium microsclerotia) affected Louisiana beans marketed in October and November of 1940. So far, this disease has not been noted on this market except in Louisiana and Mississippi beans.

Watery soft rot (Sclerotinia sclerotiorum) was found in Florida beans in 1940 from November to April, some lots averaging 10% infection.

BROCCOLI:

Bacterial soft rot (Erwinia carotovora) was the chief parasitic disease affecting California and Arizona broccoli on the market in 1940 and 1941. However, most lots showed small percentages of this decay, the highest range being 10%.

The spreading and opening of the flowers is one of the most important marketing factors. In one lot of Arizona stock marketed in November 70% of the bunches showed about 1/3 of the flowers yellow.

CABBAGE:

Alternaria leaf spot (Alternaria sp.) was particularly evident in both California and Texas cabbage in 1941. Sometimes practically every head showed appreciable blemishing by a multitude of small spots.

Bacterial soft rot (Erwinia carotovora) is frequently serious in cabbage from all regions, but it is particularly damaging in lots that become warm. For example, truck loads from Louisiana and Missouri have shown 45% loss on account of this decay. Generally the amount is less than 10%.

Black leaf speck (physiological) was found affecting 20% of the heads in a car of California stock inspected in February 1940.

Watery soft rot (Sclerotinia sclerotiorum) was noted in 1940 in Texas cabbage marketed in March and in California stock marketed in April. The highest amount was 8%, in a California car.

CANTALOUP:

Cladosporium rot (Cladosporium cucumerinum) is usually most prevalent as a stem-end or slip rot. Surface discoloration by this fungus sometimes detracts from the appearance of melons but generally does not lead to much decay. Colorado and California melons showed small amounts of this mold in 1940.

Fusarium (Fusarium sp.) was the most common cause of decay in melons from California, Arizona, and Colorado, in both 1940 and 1941. Slight spots on the ground side of the melon and infections at the stem end were most common. In few lots inspected were more than 5% of the melons affected. One exceptional lot of Colorado melons marketed in September 1941

was noted. The previous history of this car is not known but evidently some unusual circumstance must have prevailed, since 30% of the melons showed Fusarium rot in various stages.

CARROTS:

Bacterial soft rot (Erwinia carotovora). The worst decay from this cause noted in recent years was in a car of New York carrots marketed in October 1941. In the top layer of crates the roots were firm and the tops green and showed only 2% soft rot, but the roots and tops in the other layers showed about 50% decay. The effects of heating on the development of this decay is shown by the fact that the temperature was 50° in the top layer while the middle layer half way back to the bunker showed a temperature of 105°.

One lot of California stock marketed in September 1941 showed a range of from 50 to 85% soft rot in the tops and 25% in the roots. This car had a temperature of 70° on arrival.

Watery soft rot (Sclerotinia sclerotiorum) was found in Texas carrots in February, sometimes ranging to 10%, and in California stock in September 1941 ranging to 25% in a few lots.

CAULIFLOWER:

Bacterial soft rot (Erwinia carotovora) is the principal disease of cauliflower on the market. It is more or less prevalent in stock from all districts and is particularly damaging in heads that show bruising. Infections ranging from 3 to 25% were noted in stock from California, Colorado, Oregon, Washington, and New York during 1940 and 1941.

Spreading and discoloration of heads were important marketing factors in many lots.

An unusual browning of heads in a load of Michigan cauliflower in 1941 suggested the possibility that boron deficiency was responsible for this discoloration.

CELERY:

Bacterial soft rot (Erwinia carotovora), as usual, was the chief cause of decay in celery from all regions. Most cars of celery showed slight traces and occasionally the decay ranged up to 20% on arrival, and to 40% after the celery was held in stores for a few days.

Early blight (Cercospora apii) was found in small amounts in several cars but generally it was of no market significance. The most serious trouble of this kind was found in a car of Florida stock marketed in March in which 20% of the leaves were badly spotted.

Late blight (Septoria sp.) was prevalent in California celery marketed during the winter and spring of both 1940 and 1941. Many cars showed an average of around 15% and a few lots in March 1941 showed from 30 to 90% of the bunches affected, the average being 35%. Both leaves and stalks were affected in these lots. A car of Washington celery inspected in November 1940 showed 100% infection, with conspicuous lesions on leaves and stalks.

Watery soft rot (Sclerotinia sclerotiorum) ranged from 3 to 10% in California and Florida stock shipped in 1940 and 1941.

CUCUMBER:

Bacterial spot (Phytomonas [Pseudomonas] lachrymans). This blemish and decay was found in several lots of Florida cucumbers marketed in May and June of 1940. In most lots the range was from 3 to 15% with an average of approximately 8%. This decay was also noted affecting 3 to 4% of some lots of North Carolina and Alabama cucumbers marketed in 1941.

Cottony leak (Pythium aphanidermatum) is rarely seen except in occasional lots of North and South Carolina cucumbers marketed in June. In 1941, this disease occurred in a few car lots, ranging from 2 to 4%.

Green mold rot (Cladosporium cucumerinum) is generally of little consequence during the ordinary transit and marketing period, but in delayed shipments or in stock held on the market for some time the small blemishes and decay spots become of some importance. In a lot of New York cucumbers inspected in a store in September 1940 86 bushel baskets showed serious damage by this disease.

Such defects as shriveling of the ends and yellowish discoloration are often the most important marketing factors.

EGGPLANT:

Fruit rot (Phomopsis vexans). Traces were found in many shipments from Florida. The most serious decay was in a car of Florida eggplants marketed in November 1941, in which a range of 10 to 50% (average 34%) of the fruit showed this rot.

GRAPES:

Blue mold rot (Penicillium sp.) affected the stems and crushed berries in 4 cars of California grapes marketed in January 1941, and caused some depreciation in the market value although the average infection was only 2%.

Gray mold rot (Botrytis sp.) is usually the most active decay found in table grapes on this market. In most instances the range is from 2 to 6%. In rare instances, however, 50% of the stock may be infected, as was the case with a car of California Muscats inspected in September 1940.

Rhizopus rot (Rhizopus sp.) is often serious when the berries are fully ripe and show excessive bruising. One lot of New York grapes inspected in November 1940 had 60% of the bunches affected.

GRAPEFRUIT:

Blue mold rot (Penicillium italicum) was observed during February, March, and April, 1940 and 1941, ranging from 2 to 6% in many cars of Texas grapefruit. Florida stock had little of this decay but an occasional lot ranged up to 2%. In California stock marketed in July and August some cars showed from 2 to 10%, generally averaging around 3%.

Stem end rot (Phomopsis citri). Texas stock inspected in October and November 1941 often showed this disease in amounts from 2 to 13%, the average for most of the cars inspected being about 4%.

LEMON:

Alternaria rot (Alternaria sp.). Relatively little of this decay has been observed in recent years. A lot of California melons inspected in November 1940 had an appreciable amount of Alternaria infection causing button and center rots.

Blue and green mold rots (Penicillium sp.) were noted in several lots of California lemons marketed from January to May, 1940 and 1941. While most carlots had only traces, occasionally some showed from 2 to 22%, averaging 10%.

LETTUCE:

Bacterial soft rot (Erwinia carotovora) occurs to some extent in practically all shipments of lettuce. Well trimmed heads free from other diseases usually show only slight infections at the edges of outer leaves or broken midribs when shipped under good refrigeration. Serious losses occur in shipments affected by tip-burn or other diseases, and in lots not properly refrigerated. Dry-package shipments (without the usual crushed ice between layers of heads in the crate) have been observed to develop more decay and become more discolored and withered than wet package shipments. With crushed ice over the load and crushed ice within the packages the temperature of the lettuce throughout the load averages between 32° and 34°F. Without ice in the packages the few cars on which temperature data are available generally ranged between 34° and 39° F.

Tip-burn (physiological) causes a great deal of loss in California, Colorado, and Arizona lettuce. In some lots 80% of the heads are sometimes affected. Slight discoloration of the tips of the innermost leaves may cause little loss in preparation for the table, but large lesions on the outer head leaves make excessive trimming necessary and are also very subject to bacterial soft rot infection.

Downy mildew (Bremia lactucae) is seldom seen on the market because most of the outer wrapper leaves that show infection are trimmed off before shipment. In one car of California stock inspected in May 1941, downy mildew affected 2 to 4 outer head leaves in 7% of the load. Bacterial soft rot following this disease usually causes more trouble on the market than the original downy mildew infections.

ONIONS:

Bacterial soft rot (Bacterium sp.) was found causing most decay in Texas and California stock shipped in May and June in both 1940 and 1941. Some lots showed more than 50% of the bulbs infected, but the average for most cars was nearer 15 to 20%.

Fusarium bulb rot (Fusarium sp.) has been particularly evident in May shipments of white onions from Texas during the past 2 years.

Gray mold rot (Botrytis sp.) usually is present to some degree in shipments from all onion-growing regions. Stock received from Iowa, Idaho, Colorado, Wisconsin, and Minnesota during August to November, 1940 and 1941, had 6 to 25% of infected bulbs in many shipments. Texas shipments received in May and June often showed 3 to 10% of this rot.

ORANGES:

Blue mold (Penicillium italicum), in 1940 and 1941, occurred in small amounts in shipments from Florida, Texas and California. The average in a great many instances was between 3 and 5%. In rare cases as much as 20% was found.

Brown rot (Phytophthora citrophthora) affected 2 to 3% of a few lots of California oranges received in February and March 1941.

Skin breakdown (physiological) affected many lots of Florida oranges received in December 1941.

Stem-end rot (Phomopsis citri) occurred in Florida and Texas oranges in 1940 and 1941; 4 to 6% decay was present in many shipments.

PEAS:

Gray mold rot (Botrytis cinerea) was one of the most serious diseases of peas during both 1940 and 1941. Stock from California, Washington, and Idaho showed a range of from 3 to 50%. The most extensive decay of peas thus far observed on this market was in a car of Washington stock received in July 1940. The decay ranged from 15% in some hampers to 85% in others, with an average of 50%. This car stood on the track for 5 days and was then sent to the reconditioning platform to see what could be salvaged. At that time practically every hamper of peas was completely rotted. Most of the rot was caused by Botrytis, but watery soft rot was also present in appreciable amounts in many hampers.

Mosaic (virus) was present in California and Washington stock during 1940. The distorted poorly filled pods constituted an important defect in several lots.

Pod spot (Mycosphaerella pinodes) occurred in California and Utah peas in 1941. The highest percentage of infection (30%) was in a Utah car marketed in April. Small amounts of pod spot do not greatly influence the market value of the crop, but when there are several spots per pod the appearance of the lot is seriously injured. Fortunately, there is seldom any secondary infection in these spots.

Scab (Cladosporium pisicola) is one of the important blemishes in California and Washington peas, but is of little consequence from other shipping districts.

Watery soft rot (Sclerotinia sclerotiorum) was found affecting 6% of a lot of Virginia peas received in June 1940. Approximately 30% of the decay found in reconditioning the car of Washington stock described under gray mold rot above was watery soft rot. One lot of Idaho peas received in September 1941 had 9% of this decay.

PEACHES:

Black mold rot (Aspergillus sp.) is rare on peaches on this market. Its presence to a slight extent in Colorado fruit marketed in August 1940 is of interest.

Brown rot (Sclerotinia [Monilinia] fructicola) was found in many cars of Georgia peaches inspected during July 1940 when the average infection was 8%; the average for this same period in 1941 was about 12%. This disease, associated with Rhizopus, was found to be more serious in Texas stock marketed in July 1940 than in any previous season. Temperature influence during transit upon the development of these rots is well illustrated by a car in which the 2 bottom layers of baskets showed 2 to 10%, average 4% decay, the middle layer 4 to 16%, average 8%, and the 2 top layers 8 to 50%, average 20%. The temperature of the fruit at the bottom of the load was 44°, that on top 57°, at the time of inspection. Many cars of South Carolina peaches received in August 1940 averaged 10 to 35% loss due to brown rot.

Spray burn is unusual on market peaches; however, a few car lots from Colorado in August and September 1940 showed this trouble. The typical brown, firm, leather-like patches on the shoulder of the fruit constituted a serious blemish.

PEARS:

Blue mold (Penicillium sp.) and gray mold (Botrytis cinerea) were the only rots of any consequence noted in Washington and Oregon fruit during 1940 and 1941. With a few exceptions the percentage of infection was small. The most severe blue mold (6 to 20%, average 13%) was found in a car of Washington stock in March. The most severe gray mold (4 to 12%, average 8%) was found in a lot of Oregon pears in December.

PEPPERS:

Bacterial soft rot (Erwinia carotovora) occurred in peppers from Mexico, Louisiana, Texas, and California. In most instances infection was at the stem and underneath the calyx. The most severely affected lot averaged about 18% loss.

Rhizopus rot (Rhizopus nigricans) was found affecting 7 to 17% of the Florida stock marketed in February 1940. A car of Mexican stock received in March showed 55% of this decay.

Gray mold rot (Botrytis sp.) was present in Mexican and Texas peppers to a slight extent in both 1940 and 1941.

Mosaic (virus) caused distortion and mottling in a car of Florida stock received in December 1940.

PINEAPPLE:

Black rot (Thielaviopsis paradoxa) is the most serious market disease of this crop. Practically all stock from Cuba is received here from April

to June and in a great many instances the decay in 1940 and 1941 ranged from 5 to 25%.

POTATOES:

Bacterial soft rot (Erwinia carotovora) was particularly serious in Florida shipments received during the first week of April 1940. Several car lots averaged nearly 25% soft rot. One of the most seriously affected lots had a range of from 20 to 80%, average 50% decay, mostly in advanced stages. Alabama, Louisiana, and Texas stock received in May generally ranged from 5 to 8%. One car from Alabama averaged 20%. California and Nebraska potatoes received in July usually showed only slight decay when shipped under refrigeration, but cars shipped under ventilation frequently had as much as 25% decay, in both 1940 and 1941.

Fusarium tuber rot (Fusarium sp.) is the most common storage trouble of potatoes and a small amount can usually be found in most shipments. However, out of several hundred cars inspected, the majority showed an average of less than 1%. Most serious decay was found in some Minnesota potatoes marketed in April 1940 in which the average of several cars was between 10 and 15%, mostly the dry-rot stage.

Late blight (Phytophthora infestans). Minnesota and Florida potatoes inspected in January 1940 frequently showed 5 to 10%, but the most serious loss occurred in a car of Virginia potatoes received in July which averaged 40% late blight. In 1941, Florida potatoes shipped during February and March had a range from 3 to 20%, with an average of 12% in many loads. Several cars of California potatoes received in May showed this trouble affecting 3 to 10%. Wisconsin stock during October frequently averaged over 10%.

Nematodes (Heterodera marioni). Deeply penetrating nematodes affected Texas potatoes in March 1941. This was of particular interest because there were no surface eruptions and females were found 1/4 to 1/2 inch within the tuber.

Ring rot (Phytomonas sepedonica) [Corynebacterium sepedonicum] is frequently confused with ordinary soft rot on the market. In the more advanced stages of decay the 2 diseases are usually associated, but clear indications of ring rot infection are occasionally found. During 1940 a few lots of North Dakota, California, and Idaho potatoes showed this rot without much contamination by the soft rot organism.

Sclerotium rot (Sclerotium rolfsii) occurred in Alabama potatoes marketed in May 1941, generally averaging nearly 4% in the cars showing this trouble. Some lots of Louisiana potatoes showed 5% during June; one lot of Arkansas potatoes in July showed 10%.

RUTABAGA:

Gray mold rot (Botrytis sp.) is one of the important decays found in Canadian stock received during the winter and spring. Arrival inspections often show not more than 5% of gray mold rot but stock held in stores for some time may show 25 to 30% loss.

SPINACH:

White rust (Albugo occidentalis) was a serious blemish in Texas stock received during February and March 1941. Some lots showed a range of from 10 to 55% (average 30%) of the leaves badly spotted.

STRAWBERRIES:

Gray mold rot (Botrytis sp.) affected many shipments of strawberries from Florida in 1941. The most extensive decay was found on inspection of a truck shipment after it had been unloaded in a store. This lot showed decay ranging from 10 to 60% (average 35%) mostly gray mold rot; but as usual some Rhizopus was present.

SWEET POTATO:

Blue mold rot (Penicillium sp.) affected practically all of the roots in a lot of Tennessee stock that showed chilling and freezing injury also.

Rhizopus rot (Rhizopus sp.) caused most of the decay in shipments from all regions. In most lots inspected the range of decay was from 3 to 10%.

Sclerotial [charcoal] rot (Sclerotium [Rhizoctonia] bataticola) affected about 85% of the roots in 200 crates of Tennessee stock inspected in September 1941. Diplodia tubericola also was associated with this rot.

TOMATOES:

Alternaria rot (Alternaria sp.) was present to a slight extent in tomatoes from all shipping regions. As usual it was more prominent as stem-end and blossom-end infections and following growth cracking.

Bacterial soft rot (Erwinia sp.) caused most trouble in Cuban tomatoes received in January 1940 when some lots showed up to 35% loss.

Buckeye rot (Phytophthora terrestris) [P. parasitica] was present in June shipments of Texas tomatoes in 1941. In some cars the average was approximately 3%.

Late blight (Phytophthora infestans) was practically unknown in southern Florida tomatoes until potatoes were grown there. In February 1941, up to 18% infection was observed in some cars of tomatoes received from that region. California tomatoes received in November 1941 showed from 5 to 65% in many cars.

Nail head spot (Alternaria tomato). Judging from tomatoes on the market one might think that this disease has entirely disappeared; however, each year a few specimens are generally picked up in Mexican shipments during January.

Phoma destructiva caused severe decay in several cars of Florida tomatoes received during December and January, 1940 and 1941. Several cars showed a range from 8 to 40%, averaging about 22%.

Pleospora rot (Pleospora lycopersici). The most serious damage from this rot was found in a car of Mexican stock received in January 1940, which showed a range of 18 to 88%, with an average of 40%. The fungus was

mostly in the Macrosporium stage and affected the stem end. Several cars of California tomatoes received in October and November, 1940 and 1941, showed 5 to 20% loss due to this trouble.

Virus mottling is found each year in California tomatoes harvested during late fall. One or two lots of tomatoes received in November and December 1940 were of special interest because 10% of the fruit was affected by the blister stage (hyperplasia) of mosaic. The white waxy superficial irregularities on the surface of the fruit caused some inspectors to believe that the tomatoes had been heavily coated with wax. Florida stock during January 1941 also began to show definite virus mottling. This trouble had not been of any importance in Florida tomatoes previously.

WATERMELON:

Anthracnose (*Colletotrichum lagenarium*), on market melons, is usually more of a blemish than a decay, but in some instances the lesions penetrate the rind and cause serious damage. Several shipments of Oklahoma melons received in August 1940 averaged from 10 to 16% of serious blemishes and decay.

Stem-end rot (*Diplodia* sp.) is now well controlled and the serious losses incurred on the market some years ago are rare. The most serious loss of this kind noted in recent years was in a car of Georgia melons received in August 1940, in which 40% of the melons were decaying. In 1941, a slight amount of stem-end rot was found in a few lots of Texas and Missouri melons during July and August.

(DIVISION OF FRUIT AND VEGETABLE CROPS AND DISEASES).

A SINGLE-VIRUS STREAK DISEASE OF GREENHOUSE TOMATOES IN ILLINOIS

M. B. Linn and H. W. Anderson

On May 4, 1942, 2 tomato plants with symptoms of a virus disease were sent to the writers from a greenhouse operator near Kankakee, Illinois. Approximately 90% of the plants in the houses were said to have been affected. Symptoms observed on these plants were faint, necrotic streaks on the upper stems, petioles, and leaf veins, associated with a yellowing or bleaching mosaic pattern. The latter was the most pronounced symptom of all.

During the first week of September we had another report from this grower to the effect that the disease was starting to reappear in his fall crop, despite the fact that he had steam-sterilized the soil and had not grown any other plants in the houses between tomato crops. When the disease was observed the second time, he immediately rogued out the diseased plants, using extreme care to avoid contaminating the other plants. According to latest advices, practically all of the plants in his fall planting are affected with this disease.

Recently Samson (PDR 26:361) has described a single-virus streak strain of the tobacco-mosaic virus in greenhouse tomatoes in Indiana. The

Table 1. Symptoms caused by the tobacco-mosaic virus, typical strain, and the tobacco mosaic virus, single-virus streak strain, on various plants.

Plants inoculated	Height of plants at time of inoculation	No. of plants inoculated[a]	Tobacco mosaic virus: Typical strain	Tobacco mosaic virus: Single-virus streak strain
Tomato	6"	5	Light and dark green mottling of leaves	Yellow-mottling and bleaching of leaves
Eggplant (Black Beauty)	4"	5	Necrotic lesions on petioles and stems (all plants survived)	Necrotic lesions on petioles and stems (all plants died within 10 days)
Jimson weed	12"	2	Large, tan necrotic lesions	Large, tan necrotic lesions
Nicotiana tabacum	8"	3	Typical mottling of younger leaves	Numerous ring-spot-like lesions on inoculated leaves with mottling of younger leaves
Nicotiana glutinosa	3"	2	Local, tan necrotic lesions	Local, tan necrotic lesions
Nicotiana langsdorfii	3"	2	Local, tan necrotic lesions	Local, tan necrotic lesions tending to spread down midrib
Nicotiana sylvestris	3"	2	Chlorotic primary lesions followed by mottling of younger leaves	Mottling of younger leaves with development of numerous spreading ring-spot-like lesions

a/ Infection was obtained on all plants inoculated.

symptoms he gives and those on the plants we saw are very similar, with the exception that neither we nor the grower could find any symptoms on the fruits.

Shortly after the affected plants were received in May, preliminary experiments were conducted in the greenhouse to determine the identity of the virus. Extracted juice was diluted 1:1 with sterile water and treated for 10 minutes at various carefully-controlled temperatures, ranging at 10-degree intervals from 45° C. to 85° C. Two young tomato plants were inoculated with juice treated at each temperature. In addition, 6 plants were inoculated with the untreated juice and 2 plants with sterile water as controls. All plants, with the exception of the controls, developed yellow mottling within 10 days, indicating that the virus was not inactivated at 85° C. for 10 minutes. No appreciable differences in symptoms were noted among plants inoculated with the heat-treated extract and those inoculated with the untreated extract.

Another experiment was run in which one series of plants was inoculated with untreated juice from the original specimens and another series with juice from tomato plants infected with the common tobacco-mosaic virus, typical strain. The results are shown in the Table 1.

The infected tomato plants from this series (single-virus streak strain) were transplanted to the field on August 21, 3 weeks after appearance of yellow mottling, where they later set fruit. Necrotic streaking appeared in 2 or 3 weeks on the leaves and stems. The fruits remained normal in appearance, although yellow mottling and streaking of the leaves persisted until the plants were killed by frost.

It is not apparent at the present time whether the virus strain we found is the same as that reported by Samson. Had we made additional cross-transfers and had we had more abundant material with which to work, better comparisons of the 2 diseases probably could have been made.

We have no records to show that this particular disease has occurred in other greenhouses in the state; however, as Samson has pointed out for the disease in Indiana, it evidently is highly infectious and capable of causing severe losses once it becomes established in a tomato greenhouse. For that reason we are warning Illinois growers to take unusual precautions to avoid the introduction of <u>any</u> and <u>all</u> strains of the tobacco mosaic virus into their greenhouses.

(DEPARTMENT OF HORTICULTURE, UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS.)

A LATENT VIROSIS ON LOMBARD PLUM IN NEW YORK

E. M. Hildebrand

A masked or latent virus disease of Lombard plum has been found in Niagara County, New York in an Italian prune orchard containing 2 Lombard plum trees. Since this orchard had been previously affected with prune dwarf virosis it was under close observation to check on the rate of spread of that trouble. Following the removal of all trees affected with prune dwarf in 1932, an interval of 5 years passed before the reappearance

of the disease which on this occasion also attacked one of the Lombard trees.

Assuming the symptomless tree to be healthy, specimens were taken from both the diseased and healthy Lombard trees for indexing on this and 3 other plum varieties -- Italian prune, Bradshaw plum, and Damson plum -- with interesting results. Prune dwarf symptoms developed on Italian prune and Lombard plum, as was to be expected. The Bradshaw and Damson plums remained symptomless because of their resistance.[1/]

The presumably healthy Lombard tree, however, was not healthy since, following the use of grafts from this tree, severe necrotic spotting developed on the foliage of Italian prune and a milder condition on Bradshaw plum. The Damson and Lombard trees remained apparently symptomless.

The discovery that the apparently healthy Lombard plum tree was carrying a latent virus, judging by the striking symptoms produced on Italian prune, is of further interest because a latent virosis on Lombard plum has also been reported by Willison from Canada[2/].

At the present time the Lombard variety of plum has all but disappeared from culture in New York State. It is interesting to speculate on how widespread this disease may prove to be in the Lombard variety wherever grown and what part it may have played in the removal of this variety from culture.

(NEW YORK STATE COLLEGE OF AGRICULTURE).

PREVALENCE OF HELMINTHOSPORIUM LEAF SPOT OF OATS IN ARKANSAS IN 1942

H. R. Rosen

Leaf spot of oats caused by Helminthosporium avenae Eidam (perfect stage Pyrenophora avenae Ito), was very common on oats in Arkansas during 1942. While this disease has been noted each year during the past 9 or 10 years, and the pathogen was isolated in 1941 in pure cultures at this Station by L. M. Weetman, this is the first year that sufficient attention was given to it to mark it as a disease of major importance.

In an 1800-mile survey covering all of the important oat-growing counties in Arkansas, conducted during May and June, 1942, the disease was found in all of the counties surveyed (some 50 in number), although varying considerably in prevalence.

As a whole it was much more prevalent in the northern part of the State, but it is not entirely clear whether this is associated with differences in varieties grown or with differences in climatic conditions. However, varieties in the Red Rustproof group, grown mostly in the central and southern parts of Arkansas, in general showed less leaf spot than other varieties, although none was noted as being completely free.

1/ Hildebrand, E. M. Prune dwarf. Phytopath. 32:741-751. 1942.

2/ Willison, R. S. Lombard plum latent virosis. p. 73. In Hildebrand, E. M., Berkeley, G. H., and Cation, D. Handbook of virus diseases of stone fruits in North America. Michigan Agr. Exp. Sta. Misc. Publ. 1-76. 1942.

There appears to be no correlation between crown-rust resistance and spot resistance, many varieties resistant to the former disease being highly susceptible to the latter, including Bond, Victoria, Mutica Ukraina, and their hybrids. On Bond growing at the University farm, Fayetteville, it was difficult to find a leaf more than 2 weeks old that did not show 70 to 90% of the leaf area killed by Helminthosporium on June 16, when this variety was in the early milk stage. Nevertheless, some selections from Bond crosses showed as much freedom from spot as the Red Rustproofs. These, however, were exceptions and their seeming resistance or escaping ability may be entirely fortuitous. Most Victoria and Mutica Ukraina crosses were as susceptible as those of Bond.

Much more evidence is needed to prove that Victoria and Bond derivatives are more susceptible as a whole than Red Rustproof varieties, but there were pretty good indications that this was true in Arkansas in 1942. This leads to the suggested possibility that with the introduction of new crown-rust resistant varieties we may run into more difficulty with Helminthosporium leaf spot than has been the case in the past.

The following are characteristic symptoms: Dark brown streaks, often not more than a mm. or less in width and several to many mm. in length, occasionally oval or oblong spots (rarely blotches with ill-defined margins) with darker margins and lighter, sunken, dead centers; mostly on blades and sheaths but also on flowering glumes and on kernels; conidia ordinarily not abundant; in the greenhouse the disease, unless kept going by artificial means, seldom spreads after its first introduction because of paucity of conidial production.

There is some evidence that poor stands and low viability of oats experienced in the current fall seedings are in part at least due to Helminthosporium. Paul H. Millar, Chief Inspector of the Arkansas State Plant Board, reports that oats "which usually germinate well have in several recent cases been found wanting when put to a test". He found germination to be as low as 55% in these cases. Likewise, several standard commercial oat varieties and a number of new crown-rust resistant varieties have given poor stands this fall at the University farm. The lowest stand was noted in Hairy Culberson, with an estimated 5% in 4 replicated 1/50-acre drill plots. Others with poor stands in the same plots were: Forkedeer (Tennessee-092) 25%, Fulwin 35%, Fulghum-2500 25%, Lenoir 25%, Arkansas-20 (selection from Winter Turf) 40%, Fulgrain-4 50%, Victorgrain 50%, and Letoria 75%. These estimated percentages of stand compared as follows with others showing good stands: Lee 90%, DeSoto 85%, and Stanton 85%.

The evidence that poor stands were partly due to Helminthosporium came from the fact that there was much discoloration of glumes and of kernels, the latter being observed when the oats were hulled, plus the fact that from such discolored seed, which had failed to germinate, mycelium and spores typical of H. avenae were obtained. Since the number of samples examined was small, there is insufficient data at present to warrant saying how much of the poor stands was due to Helminthosporium. Incidentally, Greaney and Machacek (Sci. Agr. 22:419-437. 1942) recently reported that H. avenae was one of the fungi frequently isolated from oat seed grown in Canada and that such seed gave rise to diseased plants.

An excellent list of references on Helminthosporium leaf spot is given by Drechsler (Journ. Agr. Res. 24:641-740, 1923) as well as a thorough discussion of the taxonomy of the pathogen. Dickson (Outline of Diseases of Cereal and Forage Crop Plants, etc., 1939) brings the reference list up to more recent date under the heading of "Helminthosporium Leaf Blotch of Oats" p. 61.
(UNIVERSITY OF ARKANSAS, DEPARTMENT OF PLANT PATHOLOGY).

CORN LEAF BLIGHT VERY SEVERE IN VIRGINIA

S. B. Fenne

During the past season numerous specimens of blighted corn leaves were sent in by farmers and many more requests for information were received. In practically every case the damage to the corn leaves was caused by Helminthosporium turcicum, the fungus that causes the disease commonly known as "stripe". The most severe damage occurred in northern Virginia where the yield in some fields was greatly reduced; perhaps as much as 30%. Considerable damage from stripe also occurred in the Southwest, and in the Valley of Virginia. Very little injury was observed in the eastern part of the State. Because of the premature killing and drying of the leaves, farmers were forced to cut corn 2 to 3 weeks earlier than usual in that area. Growers reported greater damage to certain hybrids, especially the short season ones. Those reported as being most susceptible were Pioneer 300, De Kalb and De Kalb 816, Funks G-94, and U. S. 13. There were several other Pioneer hybrids severely damaged and even Reid's Yellow Dent was damaged considerably in many cases. The more resistant hybrids were reported to be Funks 135, Illinois 448, U. S. 99 and U. S. 109, Tenn. 15, and Ky. 201.

There have been many newspaper reports of bacterial wilt of corn, Aplanobacter [Phytomonas] stewarti, causing severe damage to corn, in Virginia, this year. However, I did not observe a single case that I could definitely diagnose as bacterial wilt. It might have been that bacterial wilt appeared early in the season and was followed later by stripe which obscured the wilt symptoms. Dr. Charlotte Elliott has reported several cases of bacterial wilt in northern Virginia, Maryland, and Pennsylvania, but she agrees that stripe was much more prevalent.

The past season has been most unusual. In northern Virginia and in some other parts of the State it rained almost continuously for approximately 6 weeks during the latter part of the season, providing ideal conditions for leaf blighting organisms. It appears that some farmers may be unduly alarmed regarding certain hybrids, which in a normal season do very well. However, it appears that more care should be exercised by corn breeders in the selection of hybrids that are resistant to stripe.
(EXTENSION PLANT PATHOLOGIST).

FUSARIUM EAR ROT IN SWEET CORN

P. E. Hoppe

A most interesting epidemic of Fusarium ear rot, (Gibberella fujikuroi (Saw.) Wr. (Fusarium moniliforme Sheld.)) was observed on September 16 near Lodi, Wisconsin in an 8-acre field of Golden Cross Bantam sweet corn. The field had been planted in June on a low but rich piece of land. The field had been unusually wet throughout the entire season, having been flooded several times during the summer and kept wet by frequent rains up to the time the corn reached the canning stage. The crop, nevertheless, was well grown and except for the ear rot, would have been considered an excellent field of sweet corn.

Examination of the diseased ears showed that infections had developed in wounds following very extensive pericarp cracking. Disease spread rapidly from the numerous local infections with the result that most of the ears had from one to several moldy blotches an inch or more in diameter by the time the corn was ready for canning. Some of the ears were entirely covered with mold. Needless to say, the entire field was rejected by the canners and the crop was cut for silage.

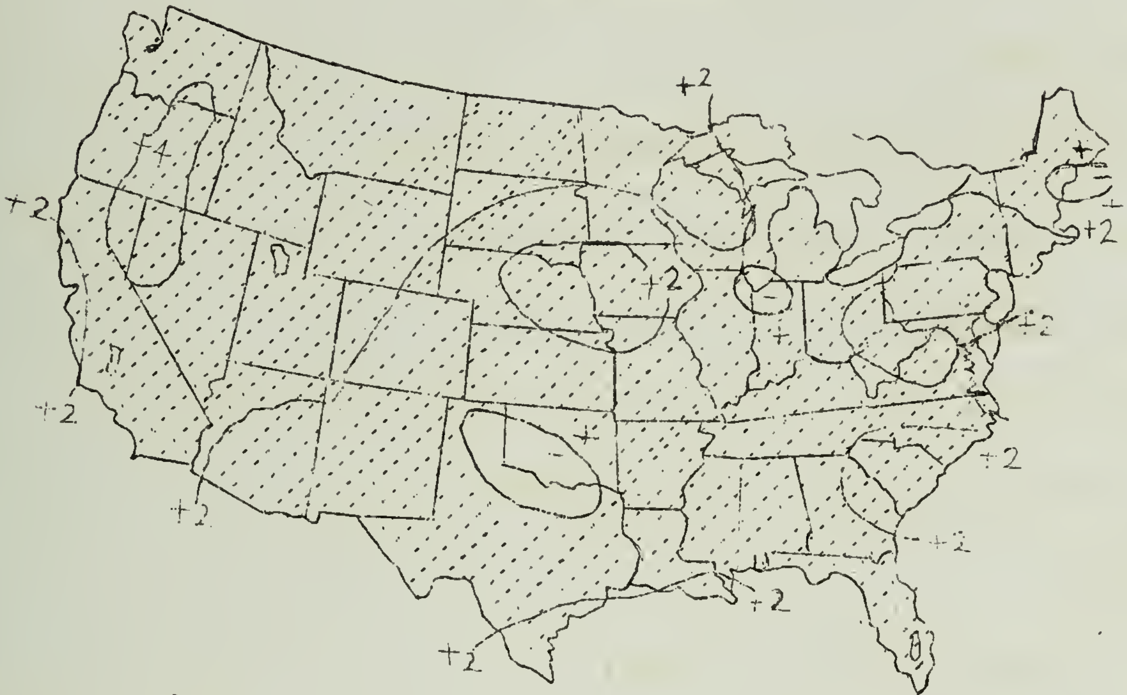
(IN COOPERATION WITH THE WISCONSIN AGRICULTURAL EXPERIMENT STATION, AND THE DIVISION OF CEREAL CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE).

OCTOBER WEATHER

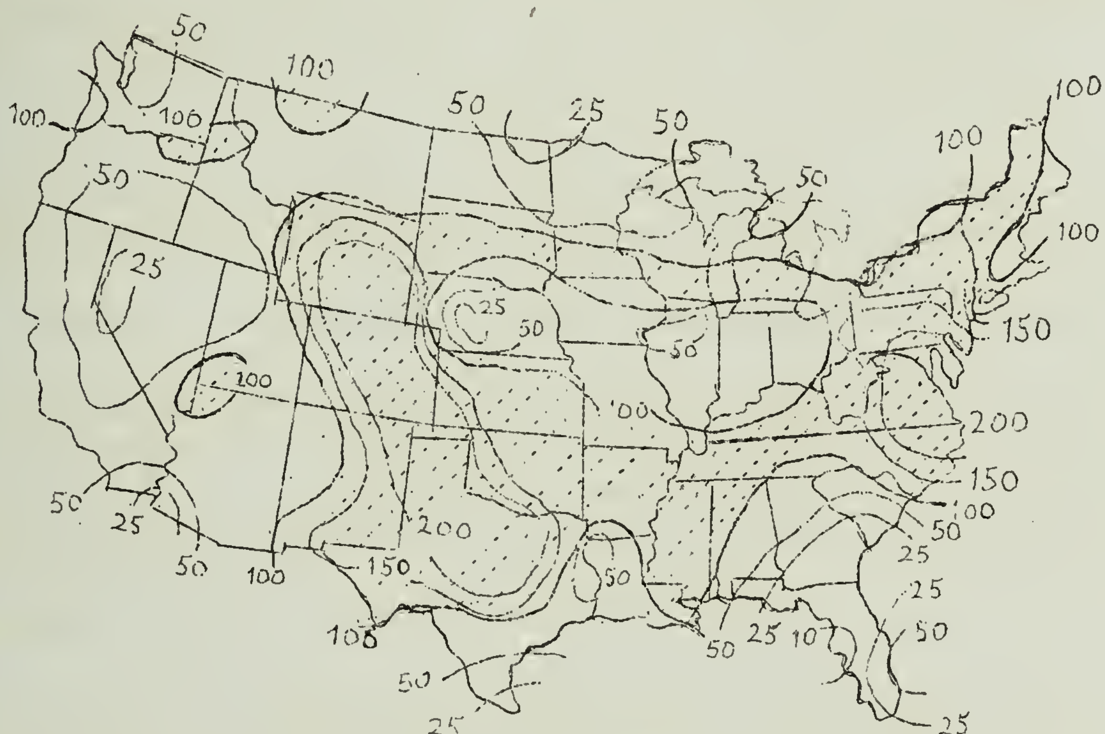
(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin for week ending November 3, 1942).

Temperature conditions for October, as a whole, in relation to normal, were uniformly somewhat above normal in nearly all sections of the country. Figure 1 shows that they averaged 2° or 3° above normal in the Atlantic area, also along the Gulf coast and in central-northern sections; the plus anomalies were slightly greater in much of the far West and Northwest. Only a very few stations reported deficiencies and these were only 1° or 2°.

While the October temperatures were characterized by geographic uniformity, rainfall was outstandingly spotted, ranging from far below normal in some areas to excessive amounts in others. Figure 2 shows that the monthly totals were extremely heavy in the middle Atlantic area, ranging up to more than twice the normal, and also in a belt extending from central Kansas northwestward to Wyoming where similar abnormalities occurred. On the other hand, rainfall was scanty in much of the South, especially Florida and southern Texas, and it was below normal in the Ohio Valley and most of the central and northern Plains. The monthly contrasts are emphasized by the record for Cheyenne, Wyo., where nearly four times the normal occurred, in comparison with nearby North Platte, Nebr., with 1 percent of normal.



Shaded areas, above normal.



Shaded areas, above normal.

Fig. 1. (Top). -- Departure of Mean Temperature from the Normal for October 1942

Fig. 2. (Bottom). -- Percentage of Normal Precipitation for October 1942

CHECK LIST REVISION

Freeman Weiss

TURNERA (TURNERACEAE)

TURNERA ULMIFOLIA L. Tree of tropical America.

Cercospora turnerae Ell. & Ev., leaf spot. P. R.

TURPINIA (STAPHYLEACEAE)

TURPINIA PANICULATA Vent. Tree of West Indies and Mexico.

Meliola guignardi Gaill., black mildew. P. R.

ULMUS (ULMACEAE)

ULMUS ALATA Michx., under U. THOMASI

ULMUS AMERICANA L., AMERICAN ELM. Tree of Growth Regions 15 to 30 incl. (except 17 and 24); widely grown for shade and especially as a street tree from New England to the Gulf States and Great Plains.

Aleurodiscus griseo-canus (Bres.) Höhn. & Litsch. and A. oakesii (Berk. & Curt.) Cke., on bark of trunks and branches. Iowa, Mo., N. Y.
Aphelenchoides fragariae (Ritzema-Bos) Christie, on cankered twig. N. J.
Apioporthe apiospora (Ell. & Holw.) Wehmeyer, twig canker. Iowa.
Botryodiplodia hypodermia (Sacc.) Petr. and B. ulmicola (Ell. & Ev.) Buisman. See Sphaeropsis ulmicola.
Camarops microspora (Karst.) Shear, on branches. Alaska, Idaho, N. Y.
Carpenterella molinea Tehon & Harris, inhabiting xylem tissues. Wis.
Cephalosporium sp., wilt. See Dothiorella ulmi.
Ceratostomella ulmi Buisman (Graphium ulmi Schwarz), Dutch elm disease*, Ceratostomella wilt. Extensive in northern N. J. and southeastern N. Y. and adjoining parts of Conn. and Pa.; localized in Ind., Md., Mass., Va., W. Va.

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* The term Dutch elm disease is entrenched in American usage but has a number of serious disadvantages, in particular the erroneous imputation that it originated in the Netherlands or owes its introduction into the U. S. to that country. Nor can it be justified on the ground that it is characteristic of the Dutch elm (Ulmus hollandica). Its non-descriptive character and the fact that current phytopathological indexes (Review of Applied Mycology and Biological Abstracts) avoid it are further points in

ULMUS AMERICANA cont.
Cercospora sphaeriaeformis Cke., leaf spot. La., Texas.
Collybia velutipes Fr., brown heart rot, wound rot. Widespread.
Coniothyrium spp., twig canker, dieback. Ill., Mass., Mich., Wis.
C. radicicola Tehon, in moribund roots. Ohio.
Corticium solani (Prill. & Del.) Bourd. & Galzin, damping off. Cosmopolitan, reported especially in nurseries in the Great Plains States.
Coryneum tumoricola Pk., leaf spot. N. Y.
Cylindrosporium ulmicolum Ell. & Ev. Conidial stage of Mycosphaerella ulmi?
Cytospora spp. (probably mostly ambiens Sacc. = Valsa ambiens Pers. ex Fr.), on dead twigs; secondary in various forms of dieback. Widespread.
C. carbonacea Fr. Conidial stage of Cryptosporella hypodermia. Mass., Texas.
C. chrysosperma Pers. ex Fr. = Valsa sordida Nits. Minn.
Cytosporina ludibunda Sacc., twig canker. Ill., Kans.
Daedalea confragosa Bolt. ex Fr., white mottled rot. Widespread.
D. unicolor Bull. ex Fr., butt rot, trunk canker. N. Y., Vt.
Daldinia concentrica (Bolt. ex Fr.) Ces. & De Not., wood rot. Widespread.
Diaporthe eres Nits. (D. ulmicola Ell. & Ev.), on branches. Mich. Also reported in the conidial stage as Phomopsis (Phoma) oblonga (Desm.) Höhn.
Diplodia spp., on dead twigs. In part D. ulmi Dearn., on twig cankers in Ill.; and also Botryodiplodia ulmicola (Ell. & Ev.) Buisman, for which see Sphaeropsis ulmicola.
(Dothidella ulmea (Schw.) Ell. & Ev.): Gnomonia ulmea. Reports received under the name D. ulmi (Duv.) Wint. probably refer to this rather than to Systremma ulmi (Schleich.) Theiss. & Syd., of which it is a synonym, and this fungus is not known to occur in our range.
Dothiorella ulmi Verrall & May (Cephalosporium sp.), dieback, wilt. Reported from Conn. to Va., Okla. & Mont.; probably general throughout range of host.
Endothia gyrosa Schw. ex Fr., on branches & exposed roots. Ga.
Eutypella spp. (E. scoparia (Schw.) Ell. & Ev., E. stellulata (Fr.) Sacc., E. tumida (Ell. & Ev.) Wehmeyer), on dead branches. Ill., Ga., Md., Mo., N. Y.

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* Cont. -- its disfavor. In the interests of rational nomenclature, such terms should disappear, but this reform can only be accomplished by the introduction and consistent use of names free from these objections. The name Ceratostomella wilt is therefore proposed for the disease caused by C. ulmi, to distinguish it from Dothiorella (Cephalosporium) wilt caused by D. ulmi, and Verticillium wilt, caused by V. alboatrum, all of which diseases have nearly identical symptoms. They could be called dieback with equal cogency since drooping or flaccidity are not characteristic of the plant as a whole.

ULMUS AMERICANA cont.

Fomes applanatus (Pers. ex Fr.) Gill., white mottled butt rot. Me., Mich., N. Y., Ohio.

F. connatus (Wein. ex Fr.) Gill., white spongy rot. N.E. States.

F. igniarius (L. ex Fr.) Kickx, white spongy heart rot. New England, Wis.

Fomes spp. Additional spp. reported on Ulmus include F. fraxineus (Bull. ex Fr.) Cke.; F. fraxinophilus (Pk.) Sacc.; F. geotropus Cke. (? F. ulmarius Sow. ex Fr.), Fla. to La. & Ark.; F. marmoratus (Berk. & Curt.) Cke., Texas; F. scutellatus Schw. ex Cke., Va.

Fusarium spp., on bark or in wood of blighted twigs. Conn., Ill., Mass. Spp. reported include F. oxysporum Schlecht., F. scirpi Lamb. & Fautr. var. compactum Wr.

Ganoderma curtisii (Berk.) Murr. and G. sessile Murr., white spongy heart and sapwood rot. N. Y., Ohio.

Gloeosporium inconspicuum Cav., leaf spot, twig blight. Mass. to Va., Okla. & Minn. The name anthracnose has been applied to this leaf spot and also those caused by the two following fungi. Since the Gnomonia spot is more generally called black spot, and that caused by G. ulmicolum is a different type of spot, the term anthracnose if used at all should preferably be restricted to G. inconspicuum.

G. ulmeum Miles. Conidial stage of Gnomonia ulmea.

G. ulmicolum Miles, leaf spot. Conn., Ill., Ind., Wis.

Gnomonia ulmea (Schw. ex Fr.) Thüm. (Gloeosporium ulmeum Miles), black spot. General.

Graphium ulmi Schwarz. Conidial stage of Ceratostomella ulmi.

Helicobasidium purpureum (Pat.) Tul., root rot. Texas.

Heterodera marioni (Cornu) Goodey, root knot. Okla., Texas.

Lenzites betulina L. ex Fr., wood rot. Ind., Md., Mass.

Macrophoma ulmicola Ell. & Ev. See Sphaeropsis ulmicola Ell. & Ev.

Marasmius spp., on outer bark of living trees. Occasional.

Melanconis sudans (Berk. & Curt.) Wehmeyer, on branches. Mich., Pa.

Melasmia ulmicola Berk. & Curt., on leaves. N. J. Said to be the conidial stage of Rhytisma ulmi Fr., which was apparently applied to a sterile leaf spot.

Microsphaera alni DC. ex Wint., powdery mildew. Ill., Iowa, Miss., Ohio.

Mycosphaerella ulmi Kleb. (Phleospora ulmi (Fr.) Wallr.), leaf spot. Mass. to Ala., Kans. & Wis. Chiefly on U. campestris.

(Myxosporium hypodermium Sacc.): Sphaeropsis ulmicola.

Nectria coccinea Pers. ex Fr., branch & trunk canker. Mass., N. J., N. Y.

N. cinnabarina Tode ex Fr., on twigs, coral spot. Widespread.

Nummularia clypeus (Schw.) Cke., and N. repanda (Fr.) Nits., on branches. Ind., Kans., Mo., Nebr.

Phleospora ulmi (Fr.) Wallr. Conidial stage of Mycosphaerella ulmi.

Phoma sp., twig canker. Ill.

P. cincta Berk. & Curt., on leaves. S. Car.

ULMUS AMERICANA cont.

Phomopsis sp. (? P. oblonga (Desm.) Höhn.), twig canker, dieback. N.E. States to S. Car., Ill. & Minn. Conidial stage of Diaporthe eres ?

Phoradendron flavescens (Pursh) Nutt., mistletoe. Ind., Texas.

Phyllactinia corylea Pers. ex Karst., powdery mildew. N. Car. to Texas and Iowa.

Phyllosticta confertissima Ell. & Ev., leaf spot. Pa.

P. erratica Ell. & Ev. Ala., Texas.

P. melaleuca Ell. & Ev. Mass. to Ala., Okla. & Wis. Reported sometimes as P. ulmicola Sacc.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

Physalospora fusca N. E. Stevens, on branches. Ala.

P. obtusa (Schw.) Cke. Conn., Ga., Kans.

Phytophthora cactorum (Leb. & Cohn) Schroet., bleeding canker. R. I.?

Pleurotus ostreatus Jacq. ex Fr., white sapwood rot, wound rot. Widespread.

P. ulmarius Bull. ex Fr., brown ring rot, wound rot. Widespread.

Polyporus spp., wood rot chiefly of dead trunks & logs, sometimes heart rot of living trees, especially:

P. admirabilis Pk., N. Y.

P. adustus Willd. ex Fr., white mottled heart rot. Ind., N. Y., Va., Wis.

P. conchifer (Schw.) Fr., on dead twigs and branches. Widespread.

P. delectans Pk., N. Y.

P. dryadeus Pers. ex Fr., N. Y.

P. fragrans Pk., Ind., Ohio.

P. frondosus Dicks. ex Fr., Conn., Ohio.

P. fumosus Pers. ex Fr., Mass., N. Y., Wis.

P. galactinus Berk., Me., N. Y.

P. gilvus (Schw.) Fr., N. Y., Wis.

P. hirsutus Wulf. ex Fr., Mo., N. Y.

P. lacteus Fr., N. Y.

P. resinosus Schrad. ex Fr., Me., Va.

P. spumeus Sow. ex Fr., white sapwood rot, wound rot. N. Y., Ohio.

P. squamosus Huds. ex Fr., white spongy heart rot. N.E. and N. Central States.

P. sulphureus Bull. ex Fr.

P. tulipiferus (Schw.) Overh., N. Y.

P. unitus Pers., Mich.

P. versicolor L. ex Fr., N. Y. Associated with "dote", a brown pocket discoloration or decay of timber.

Prosthecium ulmi Wehmeyer, on branches. Mich.

(Rhizoctonia crocorum Pers. ex DC.): Helicobasidium purpureum.

(R. solani Kühn): Corticium solani.

Rhytisma ulmi Fr. Reported from Minn., N. J., Pa.; all apparently based on sterile material or confused with Gnomonia ulmea.

Sacidium ulmi-gallae Kell. & Swingle, on leaf galls. Kans., Texas, Wis.

ULMUS AMERICANA cont.

Schizophyllum commune Fr., wood rot. Cosmopolitan.
Septobasidium pseudopedicellatum Burt, brown felt. N. Car.
Septogloeum parasiticum Kauffm. & Dearn., twig blight. Mich.
(S. ulmi Briosi & Cav.): Mycosphaerella ulmi.
S. profusum (Ell. & Ev.) Sacc., leaf spot. Ill., Miss.
Sphaeropsis sp., especially S. ulmicola Ell. & Ev., twig canker, dieback. Conn. to Miss. & Wis. (This has been called Botryodiplodia hypodermia (Sacc.) Petr. (1923) and B. ulmicola (Ell. & Ev.) Buisman 1931; Macrophoma ulmicola Ell. & Ev. is also a synonym. If it is correctly placed in Sphaeropsis and the American and European forms are the same, the proper combination is S. hypodermia (Sacc.) Höhn. No ascigerous stage is known).
(S. ulmea Ell. & Barth.): Physalospora obtusa.
Stereum spp., wood rot. Spp. reported include S. cinerascens (Schw.) Massee, S. fasciatum Schw., S. purpureum Pers. ex Fr., S. subpileatum Berk. & Curt.
Taphrina ulmi (Fckl.) Johans., leaf blister. Conn. to Miss., Mo. & Wis.
Thyronectria chlorinella (Cke.) Seeler, Ala., N. Car.
T. chrysogramma Ell. & Ev., Kans.
Uncinula macrospora Pk., powdery mildew. General.
Ustulina vulgaris Tul., white sapwood rot. Md.
Valsa ambiens Pers. ex Fr., on dead twigs. Widespread.
Verticillium sp. (? V. alboatrum Reinke & Berth.), wilt, dieback. Me. to Va. and Wis.; Oregon.
V. rhizophagum Tehon, on roots. Ohio. (Probably secondary, on trees injured by phloem necrosis).
Xylaria spp. (X. hypoxylon L. ex Grev., X. mali Fromme, X. polymorpha Pers. ex Grev.), root rot (secondary). Ill., Miss., Va.
Mosaic (infectious chlorosis, mottle-leaf), probable virus. Ohio; other reports based on similarity of symptoms from Conn. to Va. and Iowa.
Phloem necrosis, virus. Ill., Ind., Ky., Mo., Ohio, Tenn., W. Va.
Slime flux, physiological -- associated with wet soil, mechanical injuries to roots, collar and crotches, and to frost cracks; frequent on lawn and street trees.

(ULMUS CAMPESTRIS): U. PROCERA

ULMUS CARPINIFOLIA, under U. PROCERA

ULMUS CRASSIFOLIA Nutt., CEDAR ELM. Tree, sometimes shrubby, of Growth Regions 17, 20, 29, 30; wood used commercially and cult. for shade, Zone VII.

Cylindrosporium tenuisporum Heald & Wolf, leaf spot. Texas.
Diplodia sp. (D. ulmi Dearn. ?), on twigs. Texas.
Gnomonia ulmea (Schw. ex Fr.) Thüm., black spot. La., Miss., Texas.

ULMUS CRASSIFOLIA cont.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Septobasidium sydowii Couch, brown felt. Texas.
Uncinula macrospora Pk., powdery mildew. Texas.

ULMUS FULVA Michx., SLIPPERY ELM. Tree of Growth Regions 15 to 30 incl. except 17, 27 & 28, wood used commercially.

Ceratophorum ulmicolum Ell. & Kell., leaf spot. Kans., Nebr.
Ceratostomella ulmi Buisman, Dutch elm disease. Ind., N. Y., Ohio.
Dothiorella ulmi Verrall & May, dieback, wilt. Conn. to Va. & Okla.
Eutypella spp. (E. fraxinicola (Cke. & Pk.) Sacc., E. scoparia (Schw.) Ell. & Ev.), on dead branches. Ga., Ind.
Fomes connatus (Weinm. ex Fr.) Gill., white spongy rot. Conn., Mass.
F. everhartii (Ell. & Gall.) Schrenk. W. Va.
Gloeodes pomigena (Schw.) Colby, on twigs. Ind.
Gloeosporium ulmicolum Miles, leaf spot. N. Y.
Gnomonia ulmea (Schw. ex Fr.) Thüm., black spot. Widespread.
Mycosphaerella ulmi Kleb., leaf spot. N. Y. to N. Car., Kans. & Wis.
Nectria cinnabarina Tode ex Fr., on twigs, coral spot. Mo.
Nummularia repanda (Fr.) Nits., on branches. Del.
Phoradendron flavescens (Pursh) Nutt., mistletoe. Ind.
Phyllosticta confertissima Ell. & Ev., leaf spot. Kans.
P. erratica Ell. & Ev., Ala.
P. melaleuca Ell. & Ev., Ind., Mich., W. Va.
Physalospora obtusa (Schw.) Cke., on branches. Ga.
Prosthecium (Pseudovalsa) ulmi Wehmeyer, on twigs. Iowa.
Sacidium ulmi-gallae Kell. & Swingle, on leaf galls. Wis.
Taphrina ulmi (Fckl.) Johans., leaf blister. Va.
Uncinula macrospora Pk., powdery mildew. Va. to Ind. & Mo.
Verticillium albo-atrum Reinke & Berth., wilt. Pa., Wis.

ULMUS GLABRA Huds., under U. PROCERA .

ULMUS PARVIFOLIA Jacq., under U. PUMILA

ULMUS PROCERA Salisb., ENGLISH ELM. Large tree of England and W. Europe, long cult. for. shade, especially in the N.E. States, occurring in a number of vars. including yellow- and purple-leaved types. Several other European elms as U. CARPINIFOLIA Gleditsch., SMOOTHLEAF E., U. GLABRA Huds., SCOTCH E., and U. HOLLANDICA Mill., DUTCH E. (a group of hybrids between carpinifolia and glabra) are included; cult. for shade, Zones IV-V.

Ceratostomella ulmi Buisman, Dutch elm disease. Conn., N. Y.
Coniothyrium ulmi Tharp, leaf spot. Texas.

ULMUS PROCERA cont.

Gloeosporium inconspicuum Cav., leaf spot. Mass.
Gnomonia ulmea (Schw. ex Fr.) Thüm., black spot. N. J.
Heterodera marioni (Cornu) Goodey, root knot.
Mycosphaerella ulmi Kleb., leaf spot. Conn., N. Y.
Nectria cinnabarina Tode ex Fr., on twigs, coral spot. Mass., N. J., N. Y.
Phomopsis oblonga (Desm.) Höhn., twig blight. Mass.
Phyllactinia corylea Pers. ex Karst., powdery mildew. N. Car.
Phyllosticta melaleuca Ell. & Ev., leaf spot. Vt.
Sphaeropsis ulmicola Ell. & Ev., twig canker. Pa.
Taphrina ulmi (Fckl.) Johans., leaf blister. Mass., Wis.
Verticillium albo-atrum Reinke & Berth., wilt. Conn., Mass., N. J., N. Y.

ULMUS PUMILA L., SIBERIAN ELM. Tree of E. Siberia and China, cult. for shade, especially as a street tree in dry parts of Zone IV. Including U. PARVIFOLIA Jacq., CHINESE ELM, a small tree of E. Asia, grown for ornament, Zone V.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., branch canker. Ark.
Ceratostomella ulmi Buisman, Dutch elm disease. N. Y.
Chalaropsis thielavioides Peyronel, seedling root rot. N. Dak. to Okla. & Wyo.; N. J., N. Y.
Coniothyrium ulmi Tharp, leaf spot. W. Va.
Cytospora sp. (? C. chrysosperma Pers. ex Fr.), dieback, twig canker. N. Dak. to Texas & Oregon.
Didymosphaeria sp., on twigs. Texas.
Eutypella scoparia (Schw.) Ell. & Ev. and E. stellulata (Fr.) Sacc., on branches. Ala., Ga., La.
Gloeosporium ulmicolum Miles, leaf spot. Conn., Ga., Kans., Tenn., Texas.
Gnomonia ulmea (Schw. ex Fr.) Thüm., black spot. Widespread.
Heterodera marioni (Cornu) Goodey, root knot. Calif., Okla.
Libertella sp., canker. Colo.
Myxosporium hymenuloides (Sacc.) Höhn., on twigs. Okla.
Nectria cinnabarina Tode ex Fr., on twigs, coral spot. Widespread.
Phomopsis sp., on twigs, ? canker. Wis.
Phyllosticta sp., leaf spot. N. J.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Okla., Texas.
Pratylenchus pratensis (De Man) Filip., in roots. Okla.
Pythium spp., damping off. Great Plains States.
Rhizoctonia solani Kühn, damping off. Great Plains States.
Sacidium ulmi-gallae Koll. & Swingle, on leaf galls. Texas.
Schizophyllum commune Fr., wound rot. Calif.
Sphaeropsis ulmicola Ell. & Ev., twig canker. Conn.
Thyrostroma compactum (Sacc.) Höhn., trunk canker. Ill.

ULMUS SEROTINA Sarg., RED ELM. Large tree of Growth Regions 25, 27, 29; cult. for shade, Zone V.

ULMUS SEROTINA cont.
Gnomonia ulmea (Schw. ex Fr.) Thüm., black spot. Miss.
Mycosphaerella sp. (? M. ulmi Kleb.), leaf spot. Ga.

ULMUS THOMASI Sarg. (U. RACEMOSA Thomas), ROCK ELM. Large tree of Growth Regions, 18, 19, 21, 22, 23, 24, 25, 26, 27; wood used commercially. Including U. ALATA Michx., WINGED ELM, similar to preceding but of southern range, sometimes planted as a street tree in the South.

Cylindrosporium tenuisporium Heald & Wolf, leaf spot. Texas.
(C. ulmicolum Ell. & Ev.): ? Mycosphaerella ulmi.
Daedalea confragosa Bolt. ex Fr., white sapwood rot. Tenn.
Fomes igniarius (L. ex Fr.) Kickx, white spongy heart rot. Tenn.
Gnomonia ulmea (Schw. ex Fr.) Thüm., black spot. Ill., Texas, Va.
Monochaetia desmazierii Sacc., leaf spot. Ga.
Mycosphaerella ulmi Kleb., leaf spot. Ill., Miss., N. Car., Texas.
Nummularia clypeus (Schw.) Cke., on branches. Ill.
Phyllactinia corylea Pers. ex Karst., powdery mildew. N. Car. to Texas & Ill. On U. alata.
Phyllosticta melaleuca Ell. & Ev., leaf spot. Miss., Wis.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Septobasidium pseudopedicellatum Burt, brown felt. N. Car.
Septogloeum profusum (Ell. & Ev.) Sacc. (? Mycosphaerella ulmi), leaf spot. Ala.
Uncinula macrospora Pk., powdery mildew. Widespread.

UMBELLULARIA (LAURACEAE)

UMBELLULARIA CALIFORNICA (Hook. & Arn.) Nutt., CALIFORNIA-LAUREL. Evergreen tree or shrub of Growth Regions 1, 4, 5, 10; wood used commercially, grown for ornament. Zone VII.

Anthostomella oreodaphnes (Cke. & Hark.) Berl. & Vogl., on leaves. Calif.
Asterina anomala Cke. & Harkn., black mildew. Calif.
Ceuthospora sp., on leaves. Calif.
Cyclodomus umbellularia Höhn., on leaves. Calif.
Diplodia harknessii Sacc., on leaves. Calif.
D. umbellulariae Ell. & Ev., on twigs. Calif.
Fomes applanatus (Pers. ex Fr.) Gill., white mottled butt rot. Calif.
F. fomentarius (L. ex Fr.) Kickx and F. igniarius (L. ex Fr.) Kickx, white mottled heart and sapwood rot. Calif.
Gloeosporium allescherianum (P. Henn.) Wr., on leaves. Calif.
Lenzites betulina L. ex Fr., wood rot. Calif.
Leptosphaeria odora (Cke. & Harkn.) Berl. & Vogl., on branches. Calif.
Mycosphaerella arbuticola (Pk.) House, on leaves. Calif.
Nectria cinnabarina Tode ex Fr. and N. coccinea Pers. ex Fr., canker, dieback. Calif.

UMBELLULARIA CALIFORNICA cont.
Polyporus versicolor L. ex Fr., wood rot. Calif., Oregon.
Poria ambigua Bres. and P. ferruginosa Schrad. ex Fr., wood rot. Calif.
Schizophyllum commune Fr., wood rot. Calif.
Stereum albobadium Schw. ex Fr., wood rot. Calif.
Thyridaria californica Rehm, on branches. Calif.
Valsa americana Berk. & Curt., on branches. Calif.

UNGNADIA (SAPINDACEAE)

UNGNADIA SPECIOSA Endl., MEXICAN-BUCKEYE. Shrub or small tree of Growth Regions 11, 16, 17, 20, 29, 30; sometimes grown for ornament and source of honey.

Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

THE PLANT DISEASE REPORTER

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

SPREAD OF THE COMMON TOBACCO-MOSAIC VIRUS IN TOMATO FIELDS BY MEANS OF VINE LIFTERS

M. B. Linn and H. W. Anderson

In connection with tomato-dusting demonstrations for Septoria blight control in Cook County, Illinois, during the summer of 1942, it was noted that the use of vine lifters on the dusting equipment apparently was responsible for an unusual amount of mosaic in the dusted area. This condition was noticeable from a distance of several hundred feet by the pronounced greenish-yellow color and stunting of the affected plants. Close inspection and subsequent inoculation tests with tissues from these plants indicated that no virus other than the tobacco-mosaic virus, typical strain, was the cause of the disease. No doubt, other workers having occasion to use power dusters and sprayers in tomato fields may have observed a similar phenomenon.

It is estimated that approximately 5% of the plants in the field had mosaic at the time the first application of dust was made on July 21. Counts made at the time of the first picking revealed that an average of 95% of the plants in the dusted rows had mosaic, as compared with 43% in the undusted rows alongside. This would suggest that the spread of the virus in the treated area was due in large part to the vine lifters[1/] fitted on the power duster and the Farmall tractor that pulled it.

One can only speculate on what effect mechanical injury, such as bending, twisting, and the like, may have had on the severity of the symptoms. No doubt, several leaves and branches on each plant passing over the lifters were subjected theoretically to many inoculations over the period of treatment (4 1/2 weeks). Plants outside the treated area were likely to have been exposed to inoculation, if at all, only a relatively few times and on only a few leaves.

From the standpoint of actual damage done to the vines by the lifter-fitted wheels, it was calculated roughly that less than 2% of the branches, which could have been run over had no lifters been used, actually were damaged appreciably. This speaks well for the efficiency of the particular lifters we used.

It would appear that under some circumstances not well known at the present time the use of vine lifters may result in severe mosaic infections -- so severe, in fact, as to nullify any benefits from the use of the lifters and even the benefits from dusting itself.

The writers would appreciate any comments that other workers may have on the subject of vine lifters in relation to the spread of the tomato-mosaic virus.

(DEPARTMENT OF HORTICULTURE, UNIVERSITY OF ILLINOIS).

1/ The plans for these lifters were drawn from pictures kindly furnished us by Dr. J. D. Wilson, of the Ohio Agricultural Experiment Station, at Wooster.

EARLY APPEARANCE OF LATE BLIGHT OF POTATO IN OREGON IN 1942

C. E. Owens

In the Plant Disease Reporter for July 1/15, 1942, attention was called to the exceptionally early appearance of late blight caused by *Phytophthora infestans* on potatoes in certain states east of the Mississippi. Later issues of the Reporter have carried articles calling further attention to the widespread occurrence of this disease during the current season.

It may be of interest to have this additional report from Oregon. The first specimens of late blight for the season were received at the State College on June 9, 1942. These came from Aurora, Clackamas County. Other reports with specimens were received from Reedsport in Lane County on June 9, and from Scio in Linn County on June 20. By the end of June, late blight was well distributed in scattered localities all over the Willamette Valley and along the coast and lower Columbia River.

In western Oregon more or less late blight occurs on potatoes, usually during the fall after considerable rain has fallen. There is seldom enough rain in the Willamette Valley before September 1 to cause an outbreak of late blight. Along the coast and the lower Columbia River, blight frequently appears earlier than in the Willamette Valley because of the higher humidity, with fogs and mists in these regions.

In the season of 1941, the rains began about August 20 and continued throughout September and October. As a result, the outbreak of foliage blight and tuber rot caused by *Phytophthora infestans* was the worst experienced in many years. The heavy build-up of blight in the fall of 1941, followed by the almost continuously cool, cloudy weather and frequent rains during May and June of 1942, seemed to be an ideal situation for an early appearance of late blight this season on early planted potatoes.

Early in July of this year, the weather cleared and throughout most of western Oregon remained dry the remainder of the summer and fall. The blight was correspondingly checked in many localities. However, along the coast and in places along the Columbia River there was some rain and frequent fogs during July, August, and September, so that in these localities there was a continued build-up of blight throughout the summer and early fall. This was noted particularly in Multnomah County, which lies along the Columbia River extending from Portland to the Cascade Mountains. In this county there is a considerable acreage devoted to the growing of certified seed potatoes. These potatoes are planted mostly in July and reach maturity in October. Because of the early appearance of late blight on early-planted potatoes in numerous localities, these late-planted potatoes were exposed to inoculation almost as soon as they came up. Many farmers were thus caught napping and did not start spraying or dusting until the blight had a good start in many fields. Thus this locality afforded a good opportunity to observe the effectiveness of sprays and dusts applied by the growers to control this disease.

The 2 materials most widely used were bordeaux and copper-lime dust. In one or two instances cuprocide dust was used. All 3 of these materials

gave evidence of their value, depending upon timeliness and frequency of application. The most nearly perfect (practically 100%) case of control observed was a field in which copper-lime dust (20-80) had been used. The first application was made before any blight appeared and applications were repeated at approximately 1-week intervals throughout August and September. No case of such frequent applications of bordeaux or cuprocide was observed but cases were noted where fairly satisfactory control was obtained with fewer applications of these materials, leading to the conclusion that if they had been used with the same timeliness and frequency as was the copper-lime dust, equally satisfactory results might have been obtained.

A striking phenomenon observed in many fields was the fact that blight lesions appeared on stems before they became abundant on the leaves. This was noticeable in a field dusted with cuprocide. At the time the observation was made there were many dark, conspicuous lesions on the stems but the foliage had a healthy, dark-green appearance, so that from a short distance one would not suspect the presence of blight in the field. Other fields nearby which had not been properly protected were badly blighted. This was good circumstantial evidence that even though there was considerable blight in this field, mostly stem lesions, when dusted, the cuprocide dust had very effectually prevented further spread of the disease.

A number of cases of typical late blight on tomato were observed, but tomatoes were not attacked nearly to the extent that they were in the season of 1941. In several instances there was good circumstantial evidence that the blight had spread directly from potatoes to tomatoes. Cross inoculations from potato tubers to tomato fruits and vice versa substantiated the field observations.
(OREGON AGRICULTURAL EXPERIMENT STATION).

DISEASES OF SOYBEANS AND PEANUTS IN MISSISSIPPI

J. A. Pinckard

The soybean crop in Mississippi has been estimated at approximately 3,060,000 bushels of beans as of October 1. Although soybeans have been grown here for some years it is a relatively new crop and destructive epidemics of diseases have not yet been reported from this State. In the older soybean growing area, the Mississippi-Yazoo delta, we have found several of the common soybean diseases. Two were sufficiently destructive this year to cause us to be alarmed for a few weeks.

Bacterial pustule (Bacterium phaseoli var. sojense) [Xanthomonas] appeared on the lower leaves just before blossom time and caused upward progressive defoliation. Diseased fields assumed a yellowish appearance during mid June in the Mississippi delta. Rainfall above normal was experienced in this area. Other areas of the State, northeast and east-central, were undergoing severe drought conditions at this season and later. The disease was somewhat less conspicuous in the dry areas although additional infections continued to appear through the summer.

Other similar bacterial leaf spots may have been present. Of particular importance is the fact that these leaf spots were found widely distributed throughout the State, indicating perhaps that they have been here for some time.

Downy mildew (Peronospora manshurica) was found in all fields examined. It appeared to be worse in moist regions, reaching a peak in late June. This disease was also found to be common in the drought affected areas. The geographical distribution of the disease in the State indicated it to be a long-time resident.

Mosaic (virus) was scattered and sporadic. Its presence was usually explained by the owner obtaining seed from unknown sources. The disease did not seem to spread noticeably. Losses were very insignificant except on one farm visited.

Sclerotium blight (Sclerotium rolfsii) was observed commonly in small spots where soybeans were planted broadcast for hay. This disease is exceedingly common on vegetables and ornamentals but it did not appear to be widespread on soybeans.

The damage caused by these diseases on soybeans cannot be estimated with much accuracy although it is probably between 5 and 10% for the entire State. The greater portion of this damage is caused by the combined action of bacterial leafspots and downy mildew. These 2 diseases occurred together on the same leaves, causing an alarming defoliation. No varietal resistance of value was observed last year.

The peanut crop in Mississippi rose from 14,040,000 pounds last year to an estimated 41,750,000 pounds (October) this year. It being a new crop in this State, many farmers experienced poor stands. No seed treatment was used insofar as we were able to determine.

Leafspot (Cercospora sp.) was very common throughout the State. In some places it appeared in early June. Many growers have confused leafspot with normal maturity of the vines, consequently the losses are not generally recognized.

Sclerotium blight (Sclerotium rolfsii) was the only other disease observed on peanuts this year. The damage was slight.

Leafspot alone probably accounted for 10 or 15% loss of the crop this year. The damage from seedling diseases, or poor stands, undoubtedly reduced the crop appreciably. It is estimated that 60% of a normal stand was obtained.

(MISSISSIPPI AGRICULTURAL EXPERIMENT STATION).

COTTON BOLL ROTS AND THE FUNGI ASSOCIATED WITH THEM IN OKLAHOMA IN 1942

W. Winfield Ray

As a part of a project on cotton boll-rot diseases, a collection of samples from 11 counties in Oklahoma was made in September 1942. Isolations were made from pieces of tissue removed from small sectors of lesions that were disinfested in a calcium hypochlorite solution and plated on water agar.

The small water-soaked lesions characteristic of bacterial blight caused by Phytomonas malvacearum (E. F. Sm.) Bergey et al. [Xanthomonas] were extremely plentiful in almost all fields examined. Older lesions were in practically every instance found to contain a fungus, and it was from these that most of the isolations were made. A small number of fungous and bacterial lesions were found surrounding punctures made by sucking insects or larvae.

Previous cotton boll-rot surveys reported for Oklahoma by Weindling and Miller[1/] have disclosed the scarcity of the anthracnose fungus, Glomerella gossypii (South.) Edg. This year the fungus was found in 3 counties, and these records added to those already reported bring the total number of counties yielding G. gossypii to 7. These 7 counties are Lincoln, McCurtain, Muskogee, Okfuskee, Pushmataha, Sequoyah, and Tulsa.

Species of Alternaria were by far the most common fungi associated with boll rots. They were found in 100% of the samples and comprised 60% of the total fungi isolated. The frequency of occurrence of the various fungi in cotton bolls taken in the survey is indicated in Table 1.

Table 1. Frequency of occurrence of fungi in cotton bolls collected in 11 counties of Oklahoma in 1942.

	Distribution of the fungi			
	In 27 samples		In 233 bolls	
	Number	Percent	Number	Percent of total fungi
Alternaria spp.	27	100	142	60.16
Glomerella gossypii	3	11.1	6	2.54
Fusarium moniliforme	9	33.3	18	7.63
Fusariella spp.	4	14.8	5	2.12
Fusarium spp.	18	66.6	47	19.92
Others	12	44.4	18	7.63

(OKLAHOMA AGRICULTURAL EXPERIMENT STATION).

THE RATE OF APPLICATION OF CERESAN TO COTTON SEED

W. Winfield Ray

In a letter to Dr. C. H. Arndt from Dr. H. D. Barker that was later made available to all members of the Cotton Disease Council, it was suggested that experimental evidence concerning the rates of application of New Improved Ceresan necessary to disinfest and protect cotton seed was needed.

1/ PDR 23: 29-32. 1939; 23: 329-334. 1939; 24: 417-423. 1940; 25: 519-521. 1941.

Scattered evidence, principally in the form of papers presented before the members of the Cotton Disease Council at their annual meetings, has definitely indicated the feasibility of reducing the amount of Ceresan to be applied to cotton seed. At the present time the Council recommends the use of 1 1/2 ounces of Ceresan for each bushel of seed.

Since no information was available concerning the minimal amount of Ceresan necessary for effective seed treatment of cotton grown under the relatively dry conditions encountered in Oklahoma, experiments involving rate-of-application of Ceresan were undertaken in the spring of 1942 at the Agricultural Experiment Station farm at Perkins, Oklahoma. Stoneville 2B cotton seed provided for the cooperative seed treatment tests for 1942 was used. Three types of seed were employed for treatment with Ceresan: (1) fuzzy, (2) reginned (all but about 10% of the lint was removed mechanically) and (3) acid-delinted (heavy fraction obtained by gravity grading). To aliquots of each seed type Ceresan was applied at the rates of 1/2, 1, and 1 1/2 ounces per bushel. The seed were planted 3 to each hill in 60 hills for each 50 feet of row. Each treatment for each type of seed was replicated 4 times.

The results of the tests are summarized in Table 1. The data were analyzed statistically by the analysis-of-variance method. Ceresan treatment, regardless of the rate of application and the type of seed employed, resulted in stands statistically superior (odds 99:1) to the nontreated checks. No significant differences exist for the amount of Ceresan applied to the seeds of the 3 types when expressed in percentage of the final stand. The data likewise indicate the superiority (odds 99:1) of acid-delinted gravity-graded seed over the fuzzy and reginned. This feature has consistently occurred in field data over a period of years in Oklahoma tests. Usually when fuzzy and reginned seed are tested, the latter gives better stands, but when such seed is too severely machined, as the seed used here was, injury to the seed in the nature of cracks and crushing occurs. The data indicate that larger amounts of Ceresan may cause further injury to the reginned seed.

Table 1. Final stand of seedlings (percent) from 3 types of cotton seed treated with New Improved Ceresan at varying rates.*

Seed Type	Rate of Ceresan in ounces per bushel: Check	1/2	1	1 1/2	Mean
Fuzzy	66.8	77.0	81.5	81.4	76.7
Reginned (Heavily)	68.7	81.2	79.6	76.2	76.4
Acid-delinted (Heavy)	84.6	90.3	87.7	91.2	88.4
Mean	73.3	82.8	82.9	82.9	80.5

* Each number is the mean percentage of stand for 4 replications.

These tests, although they represent but one year of trial, definitely indicate that the amount of Ceresan to be applied to fuzzy, reginned, and acid-delinted seed can be reduced considerably below the 1 1/2 ounces now generally recommended.
(OKLAHOMA AGRICULTURAL EXPERIMENT STATION).

PRELIMINARY EVIDENCE SUGGESTS GUAYULE MAY BE RESISTANT TO THE ROOT KNOT NEMATODE

Wm. G. Hoyman

The need for more information on the diseases of guayule, Parthenium argentatum, has prompted the publication of the results obtained to date with respect to infestation of this rubber-producing plant by the root knot nematode, Heterodera marioni.

During the summer of 1941, the Department of Plant Pathology, University of Arizona, was requested to investigate the unhealthy condition of a squash planting at Sahuarita, Pima County, Arizona. Sahuarita is only a few miles from the former location of the Intercontinental Rubber Company where extensive guayule plantings were grown from 1916 to 1922. The investigation revealed that a heavy infestation of the root knot nematode was causing the death of many plants. This exact area where the nematodes were known to occur was selected for transplanting 13 guayule plants (main roots 6 to 8 inches in length) March 20, 1942. On the same date, soil from this area was placed in six 10-inch pots and one plant transplanted in each pot. The pots were placed in an enclosure near the greenhouse. Three months later Honey Dew melons were seeded in each pot as indicator plants. The unhealthy appearance of the melon vines in August suggested the examination of the roots for nematode infestation and this was found to be the case. The examination was made by inverting the pots and removing the contents without disturbing the soil and guayule root systems. A casual examination of the guayule roots growing adjacent to the sides and bottoms of the pots indicated a trace of root knot symptoms on one plant. The guayule plants were returned to the pots and allowed to grow until October when a more careful search was made for nematode infestation. The root systems were separated carefully from the soil, washed, and examined thoroughly for nematodes. A very slight infestation was found on one of the 6 plants. The root systems of the plants growing at Sahuarita were examined at the same time and no infestation was found. Owing to circumstances beyond control, the plants growing in the field were not irrigated after July. A lack of sufficient water for normal growth may have influenced the possibility of nematode infestation.

This limited amount of preliminary evidence indicates the plants have remained highly resistant to root knot nematode infestation to date. Experiments are in progress to substantiate this preliminary evidence.
(DEPARTMENT OF PLANT PATHOLOGY, UNIVERSITY OF ARIZONA, TUCSON, ARIZONA).

TOBACCO DISEASES IN MARYLAND IN 1942

E. A. Walker

Blue mold (Peronospora tabacina) appeared on May 4, which is much later than usual. The season had been very dry until May 21-23 when continuous rains hastened the spread and stimulated the growth of blue mold which became very destructive to medium and small size plants. Larger plants were not seriously damaged. Blue mold was generally light this year, although persistent in untreated beds so that transplanting was delayed some 10 days in spite of the drought during transplanting season. Late beds were hurt worse by blue mold than early beds. Field infection has not been observed in Maryland. Spray and gas treatments are being adopted by increasing numbers of our tobacco growers.

Anthracnose (Colletotrichum sp. or Gloeosporium sp.) appeared in the plant beds by May 15 as a general infection over the tobacco-growing area and became very destructive by May 25, killing and dwarfing plants. Many beds near Annapolis were a complete loss to growers. Many diseased plants were set into fields and anthracnose continued to develop in the field as leaf spots, and midrib and stem cankers, and persisted to the flower head. This disease was most severe in wet poorly drained soil in both field and seed bed. Seed treatment may become necessary to check its spread.

Mosaic (virus - Marmor tabaci var. vulgare) was widespread in the field this year, although less prevalent than it was in the 1941 season. Only a few fields were found showing no mosaic. Numerous fields were visited where 95% or more of the plants had mosaic developing on sucker shoots following topping. Considerable leaf-burning mosaic developed following hot days.

Ring spot (virus - Annulus tabaci var. virginiensis) was scattered to general in most field plantings, causing leaf distortion and plant dwarfing. Growers are not much concerned with this disease.

Frenching (nutritional) was observed more frequently than usual, probably owing in part to the wet growing season. It was found as readily in low as in elevated areas in the field. Some fields had only isolated plants showing the frenching symptoms.

Houseburn (various fungi) was worse in 1942 than usual, owing to the wet curing season. Early and medium late planted Maryland tobacco ripened together and caused a rush in the harvest season. Lower leaves fired in the field and farmers cut continuously to save the crop. Barn space was inadequate, and tobacco was crowded in the available room with little chance for rehanging. Damp weather persisted and growers did not resort to heat. Daytime humidity was high and night air was saturated with moisture; stalks dried out very slowly. Toward the end of the curing season continuous driving rains caused wet leaves to drape around the green stalk and rots quickly deteriorated the cured leaves. Much tobacco was darkened by the wet weather after curing. Many growers have lost 50% of their crop and the loss from houseburn for the State will exceed 15%, with further loss expected from stripping and packing the crop while too highly cased.

Wildfire (Phytomonas tabaci) [Pseudomonas] appeared in plant beds later

than usual this year. Most plants were large enough to set out when the disease attacked following heavy rains of May 21-23. Many beds showed systemic infection. The disease was carried into the field and caused a severe outbreak of blackfire following hard soaking rains at topping time. Much tobacco was damaged by leaf necrosis and was left uncut in the field. The loss was estimated in the plant beds at 3% and in the field at 12%. Spraying plant beds thoroughly with bordeaux mixture (4-6-50) 3 to 4 times early in the season prevents this disease.

Black root rot (Thielaviopsis basicola) was present to some extent in seed beds used continuously for 4 or more years. It is kept in check by selecting new plant bed sites each year or treating the old beds with chloropicrin.

Brown root rot (nutritional) was less abundant than usual and was observed only in small areas in a few fields.

Fusarium wilt (Fusarium oxysporum var. nicotianae) appeared throughout the season as scattered infections in 50% of the fields. Loss in some fields amounted to about 7% with 12% of plants diseased. Strains of Maryland tobacco showing resistance to wilt are Rawling's, Robinson's, #21, and #43.

Cercospora leaf spot (Cercospora nicotianae) appeared late in season and has spotted the cured leaf with white (frog-eye) and green spots. This disease gives an unsightly appearance to the leaf when offered for sale but does not affect the sale price of cigarette tobacco. About 20% of cured leaves showed infection. Loss from Cercospora leafspot has reduced the poundage of tobacco by about 5% in Maryland.

Some brown spot disease (Macrosporium) was observed in the maturing tobacco following wet periods. It spread rapidly and caused some "firing" of the leaves. This has not been a serious disease in Maryland, and the loss this year was about 2% which is the average for most seasons. (MARYLAND AGRICULTURAL EXPERIMENT STATION).

SMALL GRAIN DISEASES IN VIRGINIA 1942

S. B. Fenne

The first aecial infection of black stem rust, Puccinia graminis tritici, was observed in Wythe County, May 4. During the third week of May, cool weather and heavy rains occurred. Pycnial and aecial infection increased rapidly on barberry, but with no spread to grain. Leaf rust, Puccinia rubigo-vera tritici, was observed increasing slowly on wheat in the flowering stage. A week later wheat was in the head to milk stage and stem rust was spreading from barberries to grain. It was first observed in Montgomery and Bedford Counties on wheat on May 26; in Botetourt County on May 27; and on rye and barley in Grayson County May 27. Wheat leaf rust increased rapidly in all counties during the week of May 28, averaging 10 to 15% infection in practically all fields. Warm, rainy and foggy weather during the first week of June caused numerous new pycnial and aecial infections on barberry leaves. The heaviest rust observed was on wheat and barley in fields adjacent to barberry bushes. Stem rust was reported in all counties of the State, increasing rapidly near the end of the season.

Leaf rust was general.

Numerous local showers continued during the week of June 13. Stem rust infection occurred in amounts from a trace to 90% with a prevalence of 100%. The disease apparently got a much earlier start in Northern Virginia than it did in Southwest Virginia. The last new pycnial and aecial infections were observed during the week of June 13. Comparatively large amounts of crown rust of oats, Puccinia coronata, were observed during this week.

The weather during the period June 18 to July 9 was warm with cool nights and considerable rain. Much barley, rye, and wheat had been harvested at that time and oats were ready to be harvested. Conditions were ideal for both leaf and stem rust infection, and leaf rust was general throughout the State.

In practically all observations made throughout the State there was a distinct difference between areas where barberry bushes had been eradicated and in areas where barberry bushes had not been eradicated. In some cases, fields less than 1/2 mile apart varied as much as 60% in severity. Black stem rust on wheat has been more severe this year than at any time during the past 10 years. A conservative estimate places the loss for the State at 10%. Some damage was sustained even in the areas where barberries had been eradicated. Here infection apparently originated from outlying areas. Loss to rye and barley was only a trace, and to oats 2%.

Leaf rusts on grain appeared late in the season, though generally distributed. It was estimated that approximately 1% loss occurred to wheat and a trace to barley and rye.

Nematodes, Anguina tritici, did less damage this past season than in average years. It is estimated that only 0.3% loss occurred in Virginia. In the past nematode galls frequently composed 75 to 90% of the screenings of some flour mills in the State, while this year the screenings examined at a number of mills either failed to show any nematodes or only 10 to 20%.

Scab, Gibberella zeae, was not present until late in the season. This can be accounted for by the fact that the first part of the growing season was very dry, followed by an excessive rainfall just at harvest time. Scab developed rapidly late in the season but did not cause any appreciable loss.

Foot rots (various organisms) did not cause the damage that they usually cause. This probably can be accounted for because of the dry weather during the fall of 1941 and the early spring of 1942, and probably to a less extent by the increased practice of seed treatment. (EXTENSION PLANT PATHOLOGIST).

CHECK LIST REVISION

Freeman Weiss

VACCINIUM (ERICACEAE)

VACCINIUM ANGUSTIFOLIUM Ait., LOWBUSH BLUEBERRY. Low shrub of Growth Regions 22, 23, 24, 26, 27, bearing edible fruit picked commercially but not cult. Including V. CANADENSE Kalm, CANADA BLUEBERRY, of more northerly range.

Bifusella vaccinii Tehon, on leaves. N. H., N. J. (Not Hysterium vaccinii Carm., which = Gloniopsis vaccinii (Carm.) Boughey and is not known in the U. S.)
Exobasidium vaccinii (Fckl.) Wor., red leaf spot, leaf gall. Me., Wis.
Lophodermium maculare (Fr.) De Not., on leaves. N. J.
Microsphaera alni var. vaccinii (Schw.) Salm., powdery mildew. Me. to Mass. and Wis.
Monilia peckiana Sacc. & Vogl., on stems. N. Y.
Pestalotia vaccinii (Shear) Guba, on leaves. Me.
Pucciniastrum goeppertianum (Kuhn) Kleb., rust witches'-broom (III). Me. to Minn. O and I on Abies spp.
P. myrtilli (Schum.) Arth., leaf rust (II, III). Me. to Pa. and Wis. O and I on Tsuga canadensis.
Ramularia effusa Pk., leaf spot. Mich., Wis.
R. vaccinii Pk. Md., N. Y., Wis.
Septoria difformis Cke. & Pk., leaf spot. N. Y.
Valsa delicatula Cke. & Ell., on twigs. Mass., N. J.

VACCINIUM ARBOREUM Marsh., FARKLEBERRY. Large shrub or small tree of Growth Regions 17, 20, 25, 27, 28, 29, 30; cult. for edible fruit, Zone VII.

Exobasidium vaccinii (Fckl.) Wor., leaf gall. Ala., Fla.
Microsphaera alni var. vaccinii (Schw.) Salm., powdery mildew. Mass. to Ga. & Ill.
Mycosphaerella punctiformis (Pers. ex Fr.) Schroet., on leaves. Ga.
M. vaccinii (Cke.) Schroet. Ga.
Ophiodothella vaccinii Boyd, leaf spot. Md. to Ga., Texas and Ill.
Pestalotia vaccinicola Guba, leaf spot. Fla.
Phyllosticta vaccinii Earle, leaf spot. Ala., Fla., Miss., Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on branches. Ala.
Septoria albopunctata Cke., leaf spot. Fla., S. Car., Texas.

VACCINIUM CORYMBOSUM L., HIGHBUSH BLUEBERRY. Upright shrub of Growth Regions 22, 23, 24, 26, 27, 28, 29; bears edible fruit; picked commercially and cult. to a limited extent chiefly in Mass. and N. J. Including several similar plants as V. ATROCOCCUM (Gray) Heller, DOWNY B., and V. VIRGATUM Ait., RABBIT EYE B., of the southern part and V. PALLIDUM Ait., BLUE RIDGE B., of the general range.

VACCINIUM CORYMBOSUM cont.
- Alternaria sp., berry rot, dieback. Mass., N. J., N. Car.
- Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on twigs. N. J.
- Botrytis sp., twig blight, dieback. N. J., Wash.
- Cuscuta sp., dodder. Pa.
- Diaporthe vaccinii Shear, twig blight. Mass., N. J., N. Car., Wash.
- Exobasidium vaccinii (Fckl.) Wor., leaf gall. General.
- Gibbera compacta (Pk.) Shear (Venturia c. Pk.), on leaves. La., Me., Mass., Wis.
- Glomerella cingulata var. vaccinii Shear, berry rot. N. J.
- Gloniopsis sp., on leaves. Va.
- Helminthosporium inaequale Shear, on twigs. N. J.
- Leptosphaeria coniothyrium (Fckl.) Sacc., on twigs. Oregon.
- Leptothyrium conspicuum Dearn. & House, on leaves. N. Y.
- Lophodermium maculare (Fr.) De Not., on leaves. Ga.
- Melanospora destruens Shear, on roots & stems. Mass., N. J., N. Car.
- Meliola nidulans (Schw.) Cke., on twigs. Fla., N. J.
- Microsphaera alni DC. ex Wint. var. vaccinii (Schw.) Salm., powdery mildew. Widespread.
- Monilinia vaccinii-corymbosi (Reade) Honey, brown rot, twig blight. Ind., Me., Mass., N. J., N. Y.
- Mycosphaerella vaccinii (Cke.) Schroet., on leaves. N. Y.
- Myriangium asterinosporum (Ell. & Ev.) J. H. Miller, on scale insects infesting stems. N. J., N. Car.
- Pestalotia vaccinii (Shear) Guba, on stems & leaves, Mass., N. J., N. Car.
- Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves.
- Phomopsis sp., stem gall. Wash.
  - (P. vaccinii Shear): Diaporthe vaccinii.
- Phyllosticta spp., leaf spot. Ala., Fla., N. J.
  - P. cyanococci Dearn. & House, N. Y.; P. vaccinii Earle, N. J.
- Physalospora obtusa (Schw.) Cke., on twigs. N. J., N. Car.
- Phytomonas tumefaciens (EFS. & Town.) Bergey, crown gall. Mass., Miss., Wash.
- Pucciniastrum goeppertianum (Kühn) Kleb., rust witches'-broom (III).
- Ramularia vaccinii Pk., on leaves. N. J., N. Y.
- Rhizoctonia sp., ectotrophic mycorhiza, Ind.
- Rhytisma vaccinii Schw. ex Fr., tar spot. Widespread.
- (Sclerotinia vaccinii-corymbosi Reade): Monilinia v., twig blight.
- Septoria difformis Cke. & Pk., leaf spot. N. Y.
- Valsa delicatula Cke. & Ell., on twigs. N. J.
- Stunt, unidentified virus. N. J., N. Y., N. Car.

VACCINIUM MACROCARPON Ait., CRANBERRY. Creeping evergreen vine of Growth Regions 22, 23, 24, 25, 26, 27; source of commercial vars. cult. for edible fruit chiefly in Mass., N. J., Wis., Oregon & Wash. Including V. OXYCOCCUS L., SMALL CRANBERRY, a similar but smaller plant; of more northerly range, and also its var. INTERMEDIUM Gray, of the Pacific Northwest.

VACCINIUM MACROCARPON cont.
Acanthorhyncus vaccinii Shear, blotch rot of berries, also on leaves. Me. to N. Car. and Wis.; Pacific Northwest.
Alternaria sp., storage rot. N. J., Wis., Oregon, Wash.
(Anthostomella destruens Shear): Melanospora destruens.
Arachniotus trachyspermus Shear, on berries, ? storage rot. N. J.
Botrytis cinerea Pers., blossom rot. Wash.
Ceuthospora lunata Shear, black rot of berries, also on leaves. Mass., N. J., Oregon, Wash., Wis.
Cladosporium oxycocci Shear, on leaves. Mass., N. J.
(Cytospora delicatula Shear): Valsa delicatula.
Diaporthe vaccinii Shear, storage rot. Mass., N. J., Oregon, Wash., Wis.
Diplodia vaccinii Berl. & Roum., on stems. Mass., N. J., Oregon, Wash.
Exobasidium oxycocci Rostr., rose bloom, shoot hypertrophy. Mass., N. H., Oregon, Wash.
E. vaccinii (Fckl.) Wor., red leaf spot. General.
Fusicoccum putrefaciens Shear. Conidial stage of Godronia cassandrae.
Gibbera compacta (Pk.) Shear, leaf smudge. Me. to N. J. & Wis., Pacific Northwest.
Gloeosporium minus Shear, storage rot. Md., N. J.
Glomerella cingulata (Ston.) Spauld. & Schrenk var. vaccinii Shear, bitter rot of berries, also on leaves. Mass., N. J., N. Car., Oregon, Wash., Wis.
Gnomonia setacea (Pers. ex Fr.) Ces. & De Not., on stems. Oregon, Wash.
Godronia cassandrae Pk. (Fusicoccum putrefaciens Shear), end rot. General.
Guignardia vaccinii Shear, early rot, scald, blast. General.
Helminthosporium inaequale Shear, berry rot. N. J.
Leptosphaeria coniothyrium (Fckl.) Sacc., on stems. Oregon.
(Leptothyrium oxycocci Shear): Godronia cassandrae.
L. pomi (Mont.) Sacc., on fruit. N. J.
Lophodermium hypophyllum (Dearn. & House) Shear, on leaves. Mich., Minn., N. Y., Oregon, Wash., Wis.
L. oxycocci (Fr.) Karst. Me., Mass., Mich., Alaska.
Melanospora destruens Shear, storage rot. Mass., N. J., Wis.
Microsphaera alni DC. ex Wint. var. vaccinii (Schw.) Salm., powdery mildew. Ala., N. J., Ohio.
Monilinia oxycocci (Wor.) Honey, hard rot, twig blight. Me., Mass., Oregon, Wash., Wis.
Mycosphaerella nigromaculans Shear, black spot. Me., Mass., Oregon, Wis., Wash.
(M. oxycocci Dearn. & House): Guignardia vaccinii.
M. vaccinii (Cke.) Schroet., on leaves. Mass., N. J.
Myxofusicoccum callunae Shear. Conidial stage of Pseudophacidium callunae.
Naevia oxycocci Dearn., witches'-broom. Me., Mich., N. H., N. Y.

VACCINIUM MACROCARPON cont.

Penicillium spp., blue mold rot. Cosmopolitan.

Pestalotia vaccinii (Shear) Guba (P. guepini Desm. var. vaccinii Shear), on leaves, occasional storage rot. General.

Pezizella oenotherae (Cke. & Ell.) Sacc., on leaves, also storage rot. Mass., N. J., Oregon, Wash., W. Va.

Phacidium vaccinii Fr. var. oxycocci Dearn. & House, on leaves. N.Y.

Phomopsis vaccinii Shear. Conidial stage of Diaporthe vaccinii.

Phyllosticta putrefaciens Shear, on leaves, also berry rot. Mass., N. J.

Physalospora obtusa (Schw.) Cke., on berries. Mass., N. J.

Plectothrix globosa Shear, on leaves. N. J.

Pseudophacidium callunae Karst., on stems & leaves. Oregon, Wash.

Psilocybe agrariella Atk. var. vaccinii Charles, fairy ring. Mass., N. J.

Pucciniastrum myrtilli (Schum.) Arth., rust (II, III). Oregon, Utah, Wash.

Ramularia multiplex Pk., on leaves. Mich., N. Y., Wis.

(R. nigromaculans Shear): Mycosphaerella n.

Rhabdospora oxycocci Shear, on dead leaves. N. J.

(Sclerotinia oxycocci Wor.): Monilinia oxycocci.

Septoria sheareana Sacc. & Trotter , on leaves & old berries. N.J.

Sphaeronema pomorum Shear, storage rot. Mass., N. J.

Sporonema oxycocci Shear, storage rot. Me. to N. J., Wis. and Pacific Northwest.

(S. pulvinatum Shear): Pezizella oenotherae.

Strasseria oxycocci Shear, on dead leaves. Mass., N. J.

Synchytrium vaccinii Thomas, red leaf gall. Me. to N. J.

Valsa delicatula Cke. & Ell., Mass., N. J., Oregon, Wash.

False blossom, Vaccinium virus 1 Dobroscky ex Smith (Chlorogenus vaccinii Holmes). Me. to N. J., Mich., Wis., Pacific Northwest.

VACCINIUM MEMBRANACEUM Torr., BIG WHORTLEBERRY, and similar plants as V. MYRTILLUS L., MYRTLE W., V. OVALIFOLIUM Sm., OVAL-LEAF W., and V. SCOPARIUM Leib., GROUSE W. Small to large shrubs of the Pacific Northwest and N. Rocky Mt. States; fruit is picked commercially and also furnishes food for wild life.

Godronia cassandrae Pk., on twigs. Pacific Northwest.

Exobasidium parvifolii Hotson, leaf gall, witches'-broom. Oregon, Wash.

E. uliginosi Boud., rose bloom. Idaho, Oregon, Wash.

E. vaccinii (Fckl.) Wor., red leaf spot, shoot hypertrophy. Idaho, Mont., Wyo.

Leptothyrium conspicuum Dearn. & House, on leaves. Alaska.

Microsphaera alni var. vaccinii (Schw.) Salm., powdery mildew. Oregon, Wyo.

Pucciniastrum sp., leaf rust (II). Oregon, Wash. Associated with Peridermium ornamentale on Abies but connection not proved.

VACCINIUM MEMBRANACEUM cont.
Pucciniastrum goeppertianum (Kühn) Kleb., rust witches'-broom (III). Mont. to N. Mex., Calif. & Pacific Northwest.
P. myrtilli (Schum.) Arth., leaf rust (II, III). Mont. & Wyo. to Pacific Northwest.
Rhytisma vaccinii Schw. ex Fr., tar leaf spot. Alaska.
Trichopeziza coarctata Ell. & Ev., on dead twigs. Wash.

VACCINIUM MYRSINITES Lam., GROUND BLUEBERRY. Low evergreen shrub of Growth Regions 28, 29, 30; also V. VITIS-IDAEA L., COWBERRY, especially the var. MINUS Lodd., sometimes called MOUNTAIN CRANBERRY, of G. R.'s 23 & 26; and V. OVATUM Pursh, BOX BLUEBERRY of G. R.'s 1, 2, & 5, used for cut greens and furnishing food for wild life.

Ceuthospora latitans (Fr.) Höhn., on leaves. Alaska.
C. minima Cke. & Hark. Calif.
Coccomyces albidus (Phill. & Hark.) Sacc., on leaves. Calif.
Exobasidium vaccinii (Fckl.) Wor., leaf gall. Alaska, Fla., Me., N.Y.
Gibbera vaccinii Sow. ex Fr., on stems. Alaska.
Godronia cassandrae Pk., Me., Alaska.
Lophodermium maculare (Fr.) De Not. and L. melaleucum (Fr.) De Not. var. epiphyllum Zeller, on leaves. Oregon.
L. oxycocci (Fr.) Karst. Alaska.
Pestalotia maculiformans Guba & Zeller, leaf spot. Oregon.
Pezicula myrtillina Karst., on leaves. Calif.
Phyllosticta sparsa Bonar, leaf spot. Calif.
Pucciniastrum goeppertianum (Kühn) Kleb., rust witches'-broom (III). Calif., Minn., Oregon, Wash.
P. myrtilli (Schum.) Arth., leaf rust. Fla., N. H.
Venturia vaccinii Ell. & Ev., on leaves. Wash.

VACCINIUM STAMINEUM L., DEERBERRY, and V. NEGLECTUM (Small) Fern. Shrubs of Growth Regions 23, 24, 25, 26, 27, 28, 29; furnishing food for wild life.

Exobasidium vaccinii (Fckl.) Wor., red leaf spot. Md., N. Y.
Monilinia polycodii (Reade) Honey, on twigs & berries. N. Y.
Pestalotia ? vaccinii (Shear) Guba, on leaves. Miss.
Phyllactinia corylea Pers. ex Karst., powdery mildew. Miss., W. Va.
Pucciniastrum myrtilli (Schum.) Arth., leaf rust (II, III). Pa.
Rhytisma vaccinii Schw. ex Fr., tar leaf spot. N. J., N. Y., Tenn.
(Sclerotinia polycodii Reade): Monilinia polycodii.

VACCINIUM ULIGINOSUM L., BOG BILBERRY. Low shrub of Growth Regions 1, 4, 12, 13, 14, 23, 24, 26, 27; furnishes food for wild life.

Exobasidium vaccinii (Fckl.) Wor., leaf gall. Alaska, N. H.
Lophodermium maculare (Fr.) De Not., on leaves. Me., Mich.

VACCINIUM ULIGINOSUM cont.
Monilinia ledi (Nawaschin) Honey, on leaves & berries. N. Y.
Mycosphaerella vaccinii (Cke.) Schroet., on leaves. N. Y.
Podosphaera oxyacanthae (DC.) DBy., powdery mildew. Alaska.
Pucciniastrum goeppertianum (Kühn) Kleb., rust witches'-broom (III). Alaska.
P. myrtilli (Schum.) Arth., leaf rust (II, III). Me., N. H.
(Sclerotinia ledi Nawaschin): Monilinia ledi.
(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

IN THIS ISSUE

PHYTOPHTHORA INFESTANS WAS DESTRUCTIVE ON TOMATOES IN NEW YORK STATE DURING 1942

George L. McNew

Some tomato fruit are destroyed in western New York every season by *Phytophthora infestans* (Mont.) de By. Ordinarily, the disease is not very important since it rarely attacks more than 10 to 20% of the fruit in any one field and very few fields are affected. In 1939 and 1940, serious loss was reported in 2 localities on green wrap tomatoes in cold storage. During 1941, the disease was almost entirely absent since only 1 field of 3 acres was known to be affected. The 1942 season, however, was conducive to the development of a serious epiphytotic on both fruit and foliage of tomatoes throughout the State.

In general, the summer was cool and moist even though actual rainfall, in most areas, was not excessive. There were 2 cool, cloudy periods with intermittent rains late in July. During August, there were (at Geneva) only 2 days in which the temperature exceeded 90°, and only 5 others in which it exceeded 85°F. On the other hand, the temperature dropped below 50° on 4 days and below 60° on 17 days. During the month there were 5 cool, cloudy periods of at least 2-days' duration each, in which there were rainfall and excessive dews: August 1-2 with .42 of an inch of rainfall; August 8-10 with .83; August 13-17 with .77; August 22-24 with .10; and August 28-30 with .26.

This series of favorable infection periods, undoubtedly, set the stage for extensive development of the tomato strain of *P. infestans* during September. It has been shown[1] that the fungus from potatoes must be incubated on tomatoes for 6 or 7 sporangial generations before it attains a highly virulent state for the new host. There is little doubt that the fungus acquired its virulence for tomatoes during 1942 because it was very rare on this host during the 1940 and 1941 seasons. The disease was first noticed in 2 fields in Ontario County on August 21 to the extent of about 1%. The first complaint of commercial loss was received on September 2.

After the fungus had attained a virulent state, weather conditions favored its dissemination during September. During the month, there were 21 days in which the temperature dropped below 60°F., of which 13 were below 50° and 5 below 40°. Conditions were favorable for infection during September 3-5 with .09 inch of rainfall; September 8-13 with 3.18; and September 20-28 with 1.41 of an inch. The disease was general and caused severe loss by September 17 but reached its climax in most fields about September 25.

The disease was widely distributed throughout western New York and was reported or observed to cause commercial losses in all of the counties in the tomato-growing belt along Lake Ontario. The disease was most destructive, however, in the area around the northern end of the Finger Lakes in

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1/ Mills, W. R. Phytophthora infestans on tomato. Phytopath. 30: 830-839. 1940.

the counties of Ontario, Seneca, and Cayuga[2/]. Some fields were so severely affected that the crop was never harvested. Canning companies requested that the fruit be left in the field or else the growers found it unprofitable to pick and sort it.

One 20-acre field near Holcomb had an estimated loss of 1.5 tons per acre on 8 acres that were not well air-drained. The vines were 80% defoliated by August 25 and fruit infection to the extent of about 2% developed by September 5. P. infestans was identified on the underside of leaves by microscopic examination of sporangia and sporangiophores. Macrosporium [Alternaria] solani was a contributing cause of defoliation but most of the vine blight was characteristic of that caused by the late blight fungus. The loss in this field, probably, would have been more serious if the disease had not been checked by a thorough application of Bordeaux mixture 4-2-50, late in August.

Tomatoes on 20 acres in the northern part of Seneca County were described by the field man for a canning company as having at least 30% fruit infection on September 2. A conservative estimate of the loss was 3 tons per acre. On another plot of 2 acres, planted on a field seeded to potatoes in 1941, there were fully 6 tons of fruit lost per acre before picking was discontinued prematurely on September 25. In another field of 10 acres, almost half the ripe fruit was infected and the loss placed at about 4 tons per acre for a single picking.

In the Auburn district of Cayuga County, farmers reported the disease present in practically every field and attributed it to poor cultural conditions. By mid-September canning factories in the area reported that tomato pulp had an excessive concentration of mold. Much of the fruit received at the factory was 5 to 15% infected. Losses in the field were 2 to 3 times as severe.

Detailed records were taken in a field near Geneva, planted to the variety, Stokesdale, where 5 copper compounds were being tested on duplicate half-acre plots alongside unprotected plots. Four applications of fungicides were made at 11-day intervals during July and August, using 200 gallons of spray per acre. P. infestans was observed on an occasional tomato on August 25, and on about 2% of the fruit by September 10. The disease reached epiphytotic proportions in the 2 unsprayed plots by September 22. The disease was, therefore, most severe at the time of the heaviest picking since this variety did not ripen until late in the season. About 40% of the fruit had not ripened sufficiently to be harvested.

On September 27, all the fruit on 10 consecutive plants was classified according to maturity and infection. The data presented in Table 1 were taken on adjacent rows at the junction of the plot sprayed with Bordeaux mixture 4-2-50 and the unprotected plots. Groups of 10 plants exactly opposite each other in the 2 plots were examined at 3 points along the

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2/ Professor Charles Chupp has kindly reported his observations to the writer: "This year, the blight seemed most severe along the water ways; the Hudson Valley, Mohawk Valley, Finger Lakes and Great Lakes. Farther inland, there seemed to be less disease." He also volunteers the information that the last severe outbreak occurred during the period 1933-1935. In the Hudson Valley, there were individual fields in which almost 100% of the fruit was destroyed during these years.

plots, which were about 1,200 feet long. Since the plants had made excellent growth, the sprayed and unsprayed plants had overlapped somewhat. It should be remembered, therefore, in judging the data in Table 1 that the unsprayed plants may have received some protection from drifting spray, and the sprayed row examined was, undoubtedly, exposed to more inoculum than other sprayed rows more remote from the control.

Table 1. Loss of marketable fruit on unsprayed Stokesdale tomatoes in a field severely infected with *Phytophthora infestans*.

Spray plot: Fungicide	Sector	Fruit on vines[a/]: Total Number	Fruit on vines[a/]: Total Weight	Amount ripe	Amount of ripe fruit[a/]: Marketable[b/]	Amount of ripe fruit[a/]: Rotted[c/]	Amount of ripe fruit[a/]: Phytophthora infected	Phytophthora infection: Ripe	Phytophthora infection: Green
			lb.	%	lb.	lb.	lb.	%	%
Bordeaux	North	1,196	295.0	44.0	97.3	32.5	0.0	0.0	1.7
Bordeaux	Middle	1,389	351.3	26.4	60.2	31.3	0.0	0.0	2.4
Bordeaux	South	1,153	259.2	20.4	27.6	25.2	0.0	0.0	3.9
Bordeaux	Average	1,246	301.8	30.3	61.7	29.7	0.0	0.0	2.7
None	North	1,086	230.1	37.8	25.4	48.4	13.3	15.3	15.7
None	Middle	1,118	246.5	29.5	14.0	34.3	24.3	33.5	32.4
None	South	1,144	236.7	52.5	10.5	79.2	34.7	27.9	67.9
None	Average	1,116	237.8	39.9	16.6	54.0	24.1	25.6	38.7

a/ From 10 consecutive plants in row

b/ Ripe fruit fulfilling requirements of standard U. S. No. 1 and U. S. No. 2 grades.

c/ Fruit with soft rot. Much of this was, undoubtedly, due to *P. infestans* but symptoms were not conclusive.

The data in column 5 of table 1 show that a higher percentage of the fruit had ripened on the unsprayed plants than on the sprayed ones. This may be attributed either to the exposure of the unsprayed fruit to the sun because the plants were over 60% defoliated, or to the so-called "retarding effect" of Bordeaux mixture. The heavier set of fruit in the sprayed plots and the higher percentage of sound, ripe fruit produced the heavier crop of marketable fruit. There were, on the average, 6.17 pounds of

sound, ripe fruit on each sprayed plant and only 1.66 pounds on the unsprayed ones. This is equivalent (on the basis of 2,904 plants per acre) to yields of 17,918 and 4,821 pounds per acre respectively. The difference between the 2 plots in this one harvest alone amounted to over 6 tons, or 73.1%. At the established contract prices, the monetary loss would be about $110 an acre. These figures agree closely with harvest records on the entire half-acre plots as well as their duplicates, elsewhere, in the field.

From the records presented in Column 8, it is obvious that a loss of 2.41 pounds of ripe fruit per plant can be attributed directly to P. infestans. To this destruction, equivalent to 6,999 pounds per acre, probably should be added about half of the rotted fruit even though positive diagnosis was impossible. The loss of 5.4 pounds of fruit per plant by soft rot in the controls, as compared to 2.97 pounds in the sprayed plants, gives an additional balance of 2.43 pounds (equivalent to 7,057 pounds per acre) in favor of the sprayed plants.

The infection of ripe fruit represented the immediate loss from P. infestans. There would have been even more loss had the remainder of the crop been allowed to ripen because almost 39% of the green fruit were infected. Also, 2.7% of the green fruit on the sprayed plants were infected. The diagnosis of many of these infected green fruit in the sprayed plot was open to question since most of the spots were merely small, subepidermal, light brown discolorations. The infection of the young fruit produced after the last spray application is not surprising, particularly where the plants had fallen across infected vines from the control plot.

Data similar to that of Table 1 were secured by examination of fruit elsewhere in this field. Other sectors of 10 plants each, chosen at random in each of the 12 plots, showed that infection was limited, almost entirely, to unsprayed plants. Six observations in the 2 unsprayed plots revealed 32.5, 38.7, 58.8, 33.9, 63.3, and 37.3% infection of ripe fruit and 31.0, 57.2, 68.0, 33.3, 58.7, and 35.1% infection of green fruit. For those interested in control measures, it can be stated that Copper Oxychloride-sulfate, Tennessee Tribasic copper sulfate, and Copper Compound A were about as effective as Bordeaux, with Yellow Cuprocide only slightly less so.

The fungus and the disease present on the fruit in this field agreed in all respects with the published descriptions 3/, 4/. Infected fruit were placed in a moist atmosphere and after incubation for one week, 25 sporangia from each of 6 fruit were measured. The mean diameters (in microns) were: 35.4 x 17.9; 32.0 x 17.5; 30.8 x 17.9; 33.3 x 17.8; 34.1 x 17.3; and 33.3 x 17.7. These spores were slightly larger than those originally described from potato by De Bary but are quite within the range reported by Siemaszko 5/ for the fungus from tomato. These measurements and the difficulty with which the fungus grew on cultural media leave little doubt as

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3/ Tucker, C. M. Taxonomy of the genus Phytophthora de Bary. Missouri Agr. Exp. Stat. Res. Bull. 153. 1931.

4/ ____________ The distribution of the genus Phytophthora. Missouri Agr. Exp. Stat. Res. Bull. 184. 1933.

5/ Siemaszko, W. Notatki fitopatologiczne III. 1. Zgnilizna pomidorow (Phytophthora infestans DeBy. f. sp. lycopersici). Choroby; Szkadnik Roslin, Warsaw 1:43-51 (English summary) 1925. (From Tucker 3/).

to its identity.

Apparently, the fungus was widely dispersed by air-borne conidia in 1942. Some affected fields were adjacent to potatoes (the Stokesdale field, for example) but others were remote from potato fields, and had not been planted to potatoes in recent years. For example, the 20-acre field at Holcomb (page 489) had been in sod for 7 years prior to 1942, and at least 2 other severely infected fields had been completely dissociated from potato culture.

The stage is set for a severe epiphytotic in 1943 if weather conditions are favorable. Now that highly virulent strains of the fungus are widely dispersed in the commercial areas, some of them may survive so that they can attack the crop at a much earlier date and with more serious consequences than in 1942, if cool, moist conditions prevail during August of 1943.

(NEW YORK STATE AGRICULTURAL EXPERIMENT STATION, GENEVA).

1942 VEGETABLE DISEASES IN NEW JERSEY AS AFFECTED BY THE WEATHER

C. M. Haenseler

Every year many plant diseases are affected either adversely or favorably by rainfall, atmospheric humidity, maximum temperatures, degree of fluctuation in temperatures, amount of sunlight, and other factors woven together to make what is commonly called "the weather". In 1940 "the weather" was rather abnormal during the early part of the year, particularly in May, and as a result certain vegetable diseases became much more prevalent and destructive than usual during the spring and early summer of that year. The effect of the abnormal spring weather conditions of 1940 on a number of plant diseases was discussed in the June 1940 issue of PLANT DISEASE NOTES.

The 1942 "weather" also brought about some unusual vegetable disease occurrences which might be worthy of record. This year the "abnormal" period occurred late in the season and consequently the crops, as well as the specific diseases, affected, were quite different from those in 1940. Following are some of the vegetable diseases that were more prevalent or more destructive in 1942 than usual as a result of the seasonal conditions.

<u>Tomato defoliating diseases</u>. It has been many years since the tomato leaf blights (<u>Alternaria</u> [<u>solani</u>] blight, <u>Septoria</u> [<u>lycopersici</u>] blight, and <u>Stemphylium</u> blight) caused such severe defoliation as they did during August and September of this year. Even in sprayed fields that received fungicidal sprays these diseases caused 80 to 95% defoliation as a result of the prolonged period of extremely favorable conditions favoring sporulation of the fungi and infection of the leaves. The difficulty of applying fungicides and of keeping them on the foliage during the long rainy period also greatly favored the fungi. A survey showed that these 3 leaf blights were present simultaneously in most of the fields.

<u>Tomato anthracnose</u> [<u>Colletotrichum phomoides</u>] was also very prevalent in 1942, encouraged no doubt by several seasonal factors. In the first

place climatic conditions were favorable for an earlier start of anthracnose than is usual, thus giving the disease a "running start" on the later pickings. The heavy set of fruit on plants that were weakened by defoliation diseases and the difficulty of getting the fruit picked off before some were over-mature, likewise favored the anthracnose. Anthracnose commonly causes appreciable losses late in the season but this year the weather conditions favored an abnormally long "anthracnose period".

Tomato shoe-string [virus]. In the average season this disease, which causes many or all of the living leaves to become threadlike, was relatively rare, affecting only an individual plant here and there in a few fields. It is often quite prevalent in small home gardens where a wide variety of miscellaneous vegetables are grown, but rarely causes appreciable losses in large fields. This season, we observed several large fields, in which a large percentage of the plants were very severely affected. There are several factors which may have influenced the prevalence of "shoe-string" this year, some of which are associated with the weather. The seasonal conditions doubtless favored the luxuriant growth of certain weeds in which the shoe-string virus overwinters and also may have been unduly favorable for the development of aphids known to carry the disease from the overwintering host plants to the tomato. It may likewise have been influenced by factors other than the weather, such as the planting of a larger acreage of the plum and cherry types of tomato which may be more subject to the disease. Most of the serious shoe-string trouble occurred on the small-fruited varieties of tomatoes this year but it is not known whether this fact is associated with variety susceptibility or with some other factor.

Bacterial blight of Lima bean. The most destructive case of bacterial blight (Bacterium phaseoli) [Xanthomonas] on lima beans that we have ever observed occurred in a field in Hammonton this year. In this case the crop was practically a total loss. Losses were also experienced in other fields in the southern part of the State but no reports were received of total crop destruction outside the Hammonton area. This same disease was very prevalent on snap beans during and following the heavy rains of May 1940 (Plant Disease Notes, May 1940) but in that year the weather "returned to normal" within a relatively short period and consequently the disease ceased to develop before the lima bean crop had reached its stage of greatest danger.

Limas are generally less susceptible to bacterial blight than are snap beans, but in 1942 the "bad weather" apparently occurred just at the time when some of the lima bean fields were in an ideal growth stage for a severe outbreak of the disease.

Infected seed lots no doubt also played an important part in the blight outbreak in limas this year but had it not been for the prolonged period of weather highly favorable for the transmission and development of the organism causing the disease as well as for infection, little damage might have happened to the crop.

Leaf blight of sweet corn (and field corn) caused by Helminthosporium [turcicum] caused more defoliation late in 1942 than we have ever before observed in New Jersey. A few fields of late-planted sweet corn in the more humid South Jersey areas blighted down almost as if a severe frost had killed the leaves. This disease occurs in New Jersey practically every

year but usually the diseased spots are few and largely confined to the older leaves of corn stalks nearing maturity. In such cases the disease may easily be mistaken for leaf death accompanying normal ripening. This season, however, the wet period accompanied by high humidity made conditions so favorable for the disease that young corn was almost totally defoliated in some instances. Such a severe defoliation from the Helminthosporium leaf blight of late sweet corn may not occur again for many years. (From Plant Disease Notes, issued by New Jersey Agricultural Experiment Station, Department of Plant Pathology, Vol. 20, no. 6, Sept. 1942).

LEAF BLIGHT OF CORN IN WEST VIRGINIA

E. J. Wellhausen

Leaf blight primarily due to Helminthosporium turcicum was very severe throughout most of the State this year, perhaps much more severe than in any previous year. Much of the corn acreage is now planted to hybrids; namely, Ohio W-17, Iowa 939, U. S. 65 and U. S. 13. Probably more Ohio W-17 is grown than all the other hybrids put together. Of these, Ohio W-17 is the most susceptible to blight and Iowa 939 the most resistant. Most open-pollinated varieties seemed to be intermediate between Ohio W-17 and Iowa 939 in susceptibility.

Blight was most noticeable in the eastern-panhandle section of West Virginia, primarily in Jefferson and Berkeley counties. It began to appear in this section early in August and spread very rapidly. Its early appearance and rapid spread was probably due to the fact that most of the corn grown in this area was Ohio hybrid W-17. This hybrid is usually fairly ripe by September 1 in this section and much earlier than the later open-pollinated varieties formerly grown or later hybrids that could be grown. It seems that blight does not readily "take hold" until the plants reach a certain stage of maturity. Early hybrids seem to show it first or early plantings often show more blight than late plantings of the same hybrid in the same area.

In general, for the State as a whole blight was most outstanding in the longer-season areas where the tendency has been to grow hybrids a little too early for the region. In the shorter-season areas at the higher altitudes blight was prevalent but much less outstanding. The hybrids that were susceptible when grown at lower elevations often showed relatively little blight at the higher elevations. Again the earlier plantings at the higher altitudes seemed to be the first to show blight, whereas later plantings in the same vicinity often showed little leaf damage. When estimating relative susceptibility of varieties this relationship must be recognized or erroneous conclusions may be reached.

For the state as a whole blight probably caused little or no reduction in yield of grain. It did, however, reduce the value of the fodder considerably. Most of the corn was pretty well along before it was severely hit. Yields of Ohio W-17 and Iowa 939 have been compared throughout the State for the past 5 years. As an average of 36 trials in different areas

of the State prior to this year when blight was not much of a factor, Iowa 939 out-yielded Ohio W-17 by 2.5 bushels per acre. This year with a severe epidemic of blight the resistant hybrid Iowa 939 was compared to Ohio W-17 in 11 different trials throughout the State. The average difference between the 2 hybrids was the same as in previous years; namely, 2.5 bushels per acre in favor of Iowa 939. This does not indicate much damage to Ohio W-17 in grain yields. Even in the eastern-panhandle where blight seemed particularly severe, indications are that it caused no appreciable reduction in grain yields. No direct comparisons between Iowa 939 and Ohio W-17 can be made in the eastern-panhandle section since Iowa 939 was included in only a few trials in this section. However, a direct comparison between Ohio W-17 and U. S. 13, a later hybrid, can be made. Prior to this year U. S. 13 outyielded Ohio W-17 by 24% as an average of 5 trials in Jefferson county. This year with severe blight on Ohio W-17 and only a moderate amount on U. S. 13, the latter outyielded Ohio W-17 by 22% as an average of 5 trials in Jefferson county, indicating no greater difference between these hybrids than in previous years.

Control -- Since most of the hybrid corn grown in West Virginia is Ohio W-17 many farmers have obtained the idea that hybrid corn is more susceptible to blight than open-pollinated varieties. This, of course, is not true. Other hybrids equally well adapted to West Virginia and more resistant to blight are recommended. In the long-season areas Ohio W-17 could be replaced by U. S. 13, a later hybrid, intermediate in its resistance to blight and a much higher yielder on most soils. In the shorter-season areas, Iowa 939, a highly resistant hybrid and equally well adapted, could be used. (WEST VIRGINIA AGRICULTURAL EXPERIMENT STATION).

CONTROL OF DOLLAR SPOT IN MINNESOTA

Ian W. Tervet

The unavailability of mercury compounds for the control of diseases of fine turf has led to a search for substitute control measures. During the summer of 1942, dollar spot (Sclerotinia homoeocarpa Bennett) was very severe in Minnesota, the epidemic in general being much heavier than in the past few years. Consequently, greenkeepers were very interested in finding substitutes for the mercuric compounds. In fact several greenkeepers set up experiments, using different fertilizer mixtures including combinations with boron and other minor elements, in an endeavor to control the disease. None of their tests, however, gave any indication that fertilizers could be counted on to give satisfactory control of dollar spot. Limited tests with Sinox (sodium dinitro-orthocresylate) also were negative, as were tests with sulphur dusts and bordeaux mixture. Since only limited and somewhat inadequate tests were made with these compounds, there is still a possibility that some of them may be valuable in limiting dollar spot.

In the summers of 1941 and 1942, extensive tests conducted by several greenkeepers in collaboration with the Minnesota Experiment Station were made with Thiosan (50 per cent tetra-methyl thiuram disulphide) for the control of dollar spot and brown patch (Rhizoctonia solani Kühn). It was

found that Thiosan was excellent in preventing the spread of dollar spot and brown patch, and in protecting the greens from further attacks for 1 to 2 weeks, under conditions favorable for epidemics of these diseases. In the tests the compound was applied at the rate of 1 lb. per 6000 ft. of turf at 2-week intervals, the chemical being applied either as a top dressing with compost as a carrier, or by sprayer. Both methods gave good control in preventing the diseases. Attempts to control dollar spot after it was well established on greens were less successful; in some cases, even when 2 or 3 lbs. of Thiosan were applied to 6000 sq. ft. of turf, no obvious control was obtained, while the standard inorganic mercury (a mixture of mercuric and mercurous chlorides) applied at the rate of 1 lb. per 6000 ft., gave excellent control and quick recovery of the grass.

Reports on the control of dollar spot from greenkeepers in Minnesota who have used Thiosan during 1942, have been conflicting. It was found that some greenkeepers were applying Thiosan in a sand or compost carrier, and then watering the treated area. Under such conditions, where an excessive amount of water was applied, it is apparent that the chemical is less effective. On the other hand, many greenkeepers were satisfied with Thiosan as a fungicide, finding that excellent control of dollar spot and brown patch could be obtained. It appears that Thiosan will be a valuable new compound in controlling dollar spot and brown patch, but care should be taken to follow the manufacturer's recommendations for methods of application.

(DIVISION OF PLANT PATHOLOGY AND BOTANY, UNIVERSITY FARM, ST. PAUL, MINNESOTA).

GRASS DISEASES IN WISCONSIN IN 1942

J. Lewis Allison and D. W. Chamberlain

This report of the occurrence of grass diseases includes a general discussion of the most prevalent diseases as they occurred this season and a short host index listing only those diseases which were not reported in 1941.1/

Weather conditions during the 1942 growing season were favorable for the development and spread of many grass diseases. Kentucky bluegrass (*Poa pratensis* L.), the dominant pasture grass in Wisconsin, was severely attacked by powdery mildew (*Erysiphe graminis* DC.) early in the season. In the southwestern part of the State near Richland Center and in the vicinity of Madison, mildew damaged bluegrass in open pastures. Leaf rusts (*Puccinia poae-sudeticae* (Westend.) Jørstad and *P. rubigo-vera* (DC.) Wint.) were common on bluegrass, occurring concurrently with mildew, but were more noticeable in nursery plantings than in pastures. Leaf spot (*Helminthosporium vagans* Drechs.) was abundant on bluegrass both in nurseries and

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1/ Allison, J. Lewis and D. W. Chamberlain. Grass Diseases in Wisconsin in 1941. U. S. Dept. Agr., Bur. Pl. Indus. Pl. Dis. Rptr. 26 (1): 19-22. January 15, 1942.

pastures from mid-summer until late fall. Bluegrass strains[2] exhibited striking differences in reaction to the above mentioned diseases. Stripe smut (Ustilago striaeformis (Westend.) Niessl) a heretofore relatively uncommon disease of bluegrass in Wisconsin, was found sparingly in several localities in the State and occurred abundantly in the southwestern pasture region around Richland Center. Here every pasture was infected with smut and in many cases damage was extensive. Red top (Agrostis alba L.) was also severely attacked by leaf smut. In one pasture numerous collections of smutted bluegrass plants examined microscopically, yielded chlamydospores of Urocystis agropyri (Preuss) Schröt. This is the first record of Urocystis attacking bluegrass in Wisconsin. All other collections from the same locality proved to be Ustilago striaeformis.

Smooth bromegrass (Bromus inermis Leyss) was attacked by several diseases during the course of the season. Leaf scald (Rhynchosporium secalis (Oud.) Davis) appeared early, was abundant by mid-June, diminished during the summer and reappeared in early fall. Scald caused extensive damage to many nursery progenies. Bacterial spot (Phytomonas coronafaciens (Elliot) Bergey et al. var. atropurpurea (Reddy & Godkin) Magrou) [Pseudomonas] was moderately severe on many nursery progenies during late spring and early summer. Other bromegrass leaf spots (Selenophoma bromigena (Sacc.) Sprague & Johnson), Helminthosporium bromi Died.) and ergot (Claviceps purpurea (Fr.) Tul.) were commonly observed but never became severe. Stagonospora bromi Smith & Ramsb., heretofore not recorded as occurring on bromegrass in Wisconsin, was found to be quite abundant as a leaf spot during September and October.

Several other leaf spots and foliage abnormalities occurred on inbred lines and clonal progenies[2]. These appeared to be of non-parasitic origin, as in no case was a causal organism successfully isolated. From a grass disease survey made during mid-July in the bromegrass nurseries located at Ames, Iowa and Lincoln, Nebraska, it was apparent that diseases were much more severe at Madison than at either of the other 2 locations.

Sudan grass (Sorghum vulgare Pers. var. sudanense (Piper) Hitchc.) as in 1941, was again host to several diseases. Bacterial spot (Phytomonas andropogoni (E. F. Smith) Bergey et al) [Pseudomonas] appeared soon after seedling emergence and persisted until mid-summer. Although very severe, it alone was not especially destructive. Leaf blight (Helminthosporium turcicum Pass.) and anthracnose (Colletotrichum graminicolum (Ces.) Wilson) did not appear until late summer. They developed very rapidly, damaging field stands, and injuring many nursery progenies.

Inbred lines[2] of Sudan grass exhibited striking differences in degree of resistance to these 3 diseases. Several "leaf spots" of non-parasitic origin were also observed on inbred lines of Sudan grass.

Diseases on hosts not listed in the 1941 report but commonly observed this season:

Agropyron repens (L.) Beauv.
  Bacterial spot --- Phytomonas coronafaciens (Elliot) Bergey et al. var. atropurpurea (Reddy & Godkin) Magrou [Pseudomonas]
  Powdery mildew --- Erysiphe graminis DC.

2/ Nurseries of the grass breeding project, Department of Agronomy and Division of Forage Crops and Diseases, Bureau of Plant Industry, U. S. Dept. Agr., cooperating.

Agrostis alba L.
  Stripe smut --- Ustilago striaeformis (Westend.) Niessl
Bromus inermis Leyss.
  Leaf spot --- Stagonospora bromi Smith & Ramsb.
Bromus marginatus Nees.
  Head smut --- Ustilago bullata Berk.
Festuca rubra L.
  Ergot --- Claviceps purpurea (Fr.) Tul.
  Brown stripe --- Scolecotrichum graminis Fckl.
  Stem rust --- Puccinia graminis Pers.
Hordeum jubatum L.
  Flag smut --- Urocystis agropyri (Preuss.) Schröt.
Panicum virgatum L.
  Leaf spot --- Cercospora fusimaculans Atk.
Poa pratensis L.
  Flag smut --- Urocystis agropyri (Preuss.) Schröt.

(COOPERATIVE INVESTIGATIONS OF THE WISCONSIN AGRICULTURAL EXPERIMENT STATION AND THE DIVISION OF FORAGE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE).

RED CLOVER DISEASES IN WISCONSIN IN 1940-41-42

J. Lewis Allison

This report of red clover diseases covers 3 consecutive seasons and describes the variability of the principal diseases from year to year.

Powdery mildew (Erysiphe polygoni DC.), the most common pathogen attacking red clover varieties grown in Wisconsin, was prevalent each year. Mildew was very severe during 1940, relatively light during 1941, and moderatelyly severe in 1942. These differences have been influenced primarily by weather conditions. Abundant cloudy weather and rainfall during July and August of 1940, and a mean temperature of about 70°F., were ideal for second crop clover growth. Mildew developed and spread rapidly on this growth. In 1941, rainfall was below normal and it was hot and dry during July and August. General conditions were poor for either good clover growth or mildew development. During 1942 the total rainfall for July and August was about normal with cloudy weather and low temperatures which served to produce an excellent second crop of clover. A moderate amount of mildew developed.

Northern anthracnose (Kabatiella caulivora (Kirch.) Karak.) caused considerable loss to the first crop of red clover in Wisconsin in 1942. Ordinarily northern anthracnose is spotted in occurrence and limited in its attack. The disease may develop in several small areas in the same field but only occasionally spreads to involve entire fields. This localized type of attack was present in 1940 and 1941. During 1942, however, entire fields throughout Wisconsin were seriously damaged. Northern anthracnose develops best between 60-65°F. under conditions of moderate humidity. The organism cannot withstand extreme periods of heat and drought and rarely attacks the second crop of clover. Much of the inoculum produced during the early part of each season does not survive until fall of

the same season, when reinfection may occur. Fall-infected plants carry the organism through the winter and provide inoculum for the following season. Spores of this organism are disseminated chiefly by free water and the disease does not spread rapidly from the loci of infection under normal field conditions.

During late September of 1941, rainfall was much above normal throughout most of Wisconsin. This provided a rapid regrowth of red clover and widespread fall infection with Kabatiella. As fall infection is less severe than spring infection, it passed relatively unnoticed. This light fall epiphytotic provided the inoculum for spring infection of early clover and, combined with abundant rainfall, cloudy weather and low temperatures, resulted in a general epiphytotic in 1942 compared with the spotted attacks of 1940 and '41.

Leaf spot (Stemphylium sarcinaeforme (Cav.) Wilt.), rust (Uromyces trifolii (Hedw. f.) Lév.) and sooty blotch (Cymadothea trifolii (Pers.) Wolf), ordinarily are considered minor diseases of red clover in Wisconsin but under ideal conditions may develop rapidly during early fall and cause damage. These 3 diseases were destructive during the fall of 1940, occurred sparingly in 1941 causing little damage, and were quite prevalent during the early fall of 1942.

In 1941, as mentioned earlier, there was a drought period during the growing period of the second clover crop. Owing to the weakened condition of clover, a great deal of the black stem disease developed, causing considerable damage. Isolations from blackened stems from many regions of the state showed that the principal organism involved was Phoma trifolii Johnson & Valleau. There were in addition several secondary organisms, attacking as weak parasites, that were responsible for some of the black stem.

Other red clover diseases, leafspot (Cercospora zebrina Pass.) and bacterial spot (Phytomonas trifoliorum Jones et al) [Pseudomonas] occurred each year causing slight damage. Virus diseases have been observed, especially in fields of second-year clover, but have been limited in occurrence and caused little damage. Root rot in second-year fields of red clover has been prevalent on the sandy soils of central Wisconsin. Several species of Fusarium have been isolated from diseased roots and upon reinoculation have been found weakly parasitic. As yet no one organism has been determined definitely as causing all the root rot.

(COOPERATIVE INVESTIGATIONS OF THE WISCONSIN AGRICULTURAL EXPERIMENT STATION AND THE DIVISION OF FORAGE CROPS AND DISEASES, BUREAU OF PLANT INDUSTRY, U. S. DEPARTMENT OF AGRICULTURE).

PEANUT DISEASES IN CERTAIN SOUTH TEXAS COUNTIES IN 1942

Glenn KenKnight

In Wilson County, Texas, the 1942 season was marked by moderate rainfall in April and May with a rather severe drought in June broken by excessive rainfall early in July. Thereafter the weather was favorable to the peanut crop until the hurricane of August 29 to 30, which was followed by excessive rainfall amounting to about 15 inches in 2 weeks in most of the county. Commercial peanuts were all of the Spanish variety. Thrips

injury was conspicuous in all fields during June, although damage did not appear to be great. The injury became inconspicuous during the wet period in July but increased again during August. July rains delayed maturity of the peanut crop, and harvest, which progressed slowly due to shortage of labor, got underway about 2 weeks later than usual with few fields dug before August 5.

Cercospora leaf spot [Cercospora spp.] was most conspicuous in very early and very late peanuts in Wilson County but caused appreciable defoliation in only a few fields. It had been noted in earlier surveys that leaf spot was always most conspicuous in fields that had been planted frequently to peanuts. In the 1942 survey the preceding crop was recorded whenever possible. Of 60 fields surveyed for leaf spot in this county, leaf spot was rare in 26, averaging 2 or fewer lesions per plant. None of these 26 fields were known to have been planted to peanuts in 1941, 4 had been out of cultivation, and 16 had been in crops other than peanuts. Of 18 fields in which leaf lesions averaged from 3 to 50 per plant, 6 were known to have been in peanuts in 1941, 7 in other crops, and 4 undetermined. Of 14 fields averaging 50 or more lesions per plant but without appreciable defoliation, 4 were known to have been in peanuts in 1941 and 1940 or in peanuts frequently, 2 were in other crops in 1941 but in peanuts in 1940, and 2 were undetermined. All 3 of the fields in which leaf spot caused serious defoliation had been in peanuts in 1941 and 2 of them were known to have been planted to peanuts frequently.

In 14 fields in Live Oak County where in most instances peanuts were planted for the first time, and in 9 of 10 fields in Atascosa, Dimmit, and Frio Counties where rainfall had been less than in Wilson County, leaf spot caused no loss. However, near Dilley in Frio County leaf spot was severe on a field that had been planted to peanuts in 1941 and had received more rainfall than the others.

In south Texas, crop rotation may serve as a control measure for peanut leaf spot.

Loss from southern blight [Sclerotium rolfsii] is determinable only in fields where the nuts are mature or nearly so, and consequently was not recorded in all instances. In Wilson County on 16 sandy fields loss from the disease ranged from 8 to 50% with an average of 27%. The disease was not found on any black-land fields. In Live Oak County southern blight was found in only one of 14 fields. That field was sandy land that had been planted to peanuts frequently since 1917. In Atascosa County the disease was found on all 4 fields noted causing an average loss of 29%. All of these fields were sandy soil that had probably been planted to peanuts frequently.

Loss in peanuts from cotton root rot [Phymatotrichum omnivorum] was restricted to the heavier soil, and, because of the greatly expanded peanut acreage in such soil, was more prevalent than usual. The disease was noted on 20 of 60 fields in Wilson County, affecting 5% or less of the plants in 14 fields and up to 35% in the others. Cotton root rot caused much more damage on the heavier soils in Live Oak County where it was found on 11 fields killing up to 83% of the plants with 15% or more killed in 7 fields. No cotton root rot was noted on peanuts in Atascosa and Dimmit Counties, and only a trace in one field in Frio County.

Physiologic chlorosis, apparently due to soil alkalinity, was present on 3 of 60 fields in Wilson County, stunting severely all plants in 2 of the fields. The disease was noted as severe in one field in Live Oak County. A very common type of chlorosis, apparently genetic in origin, was widespread, generally affecting 1 to 2% of the plants to a varying degree.

A virus disease of peanuts, readily transmissible by the carborundum method and causing severe stunting, a rosette appearance, and clearing of the veins in young leaflets, was widespread throughout Wilson, Atascosa, and Frio Counties, although generally only a few plants would be found in any field.

(TEXAS AGRICULTURAL EXPERIMENT STATION, STOCKDALE, TEXAS).

BRIEF NOTES ON PLANT DISEASES

VERTICILLIUM WILT OF COTTON IN OKLAHOMA: Specimens of diseased cotton plants forwarded to this department in late September of 1942 were found to be infected with Verticillium albo-atrum Reinke & Berth. This disease has been previously reported from several of the cotton-producing states, including Oklahoma.

The Verticillium fungus was first isolated from diseased cotton plants received from near Geary, Oklahoma. The plants had been growing in soil with a pH range of 6.0 to 6.5. Examination of this field at a later date showed the disease to be present in small isolated areas of just a few plants. The estimated loss was from 1 to 2%.

A period of 12 to 16 days was required to isolate and identify Verticillium from diseased root tissues. Negative results were obtained when attempts were made to isolate from aerial parts of the diseased plants; however, less than 50% of the root sections plated yielded Verticillium. This difficulty of obtaining positive cultures of the organism has been experienced by other workers, according to recent correspondence.

In October, diseased cotton plants were received from a field near Mangum that were also infected with V. albo-atrum. The collector of this lot of plants reported large areas of leafless, dying plants in the diseased field.

Verticillium wilt of cotton has been reported once before from Oklahoma. (P.D.R. Supp. 86:63. 1933). The occurrence of Verticillium this year may be correlated with the unusual, somewhat excessive amount of precipitation Oklahoma has experienced. The 1942 findings indicate that in the future all collections of Oklahoma-grown cotton plants suspected of being Fusarium-wilted should be subjected to isolation techniques to determine the possibility of Verticillium being present. (J. Harvey McLaughlin, Oklahoma Agricultural Experiment Station, Stillwater, Oklahoma).

PHYTOPHTHORA INFESTANS ON THE WEED SOLANUM SARACHOIDES: On a truck farm near Colma, California, on October 22, 1942, abundant leaf and stem infection of Phytophthora infestans was found on Solanum sarachoides Sendt. localized around scattered volunteer potato plants showing typical late blight infection. As on the potato leaves, there was abundant sporulation of the fungus on the under side near the advancing margin of the large,

irregular, watersoaked leaf lesions on the weeds. The mycelial growth and sporulation of the fungus from the weed when cultured on the freshly cut surface of a healthy potato tuber was typical of P. infestans from potato. This weed, which in California has previously been referred to Solanum villosum L., was identified as S. sarachoides Sendt. by Dr. G. L. Stebbins of the Division of Genetics, who states that it is an introduction from South America. (M. W. Gardner and C. E. Yarwood, Division of Plant Pathology, University of California, Berkeley).

SEPTORIA LEAF SPOT ON CELTUCE IN ILLINOIS: Prof. M. B. Linn of the Department of Horticulture of the Illinois Agricultural Experiment Station, sent a specimen of badly spotted leaves of celtuce, an oriental variety of Lactuca sativa, collected at Glen Ellyn, Illinois. The fungus associated with the spots was Septoria lactucae Pass., a common and widespread parasite of other lettuce varieties, but apparently not heretofore reported on celtuce. (J. A. Stevenson, Division of Mycology and Disease Survey).

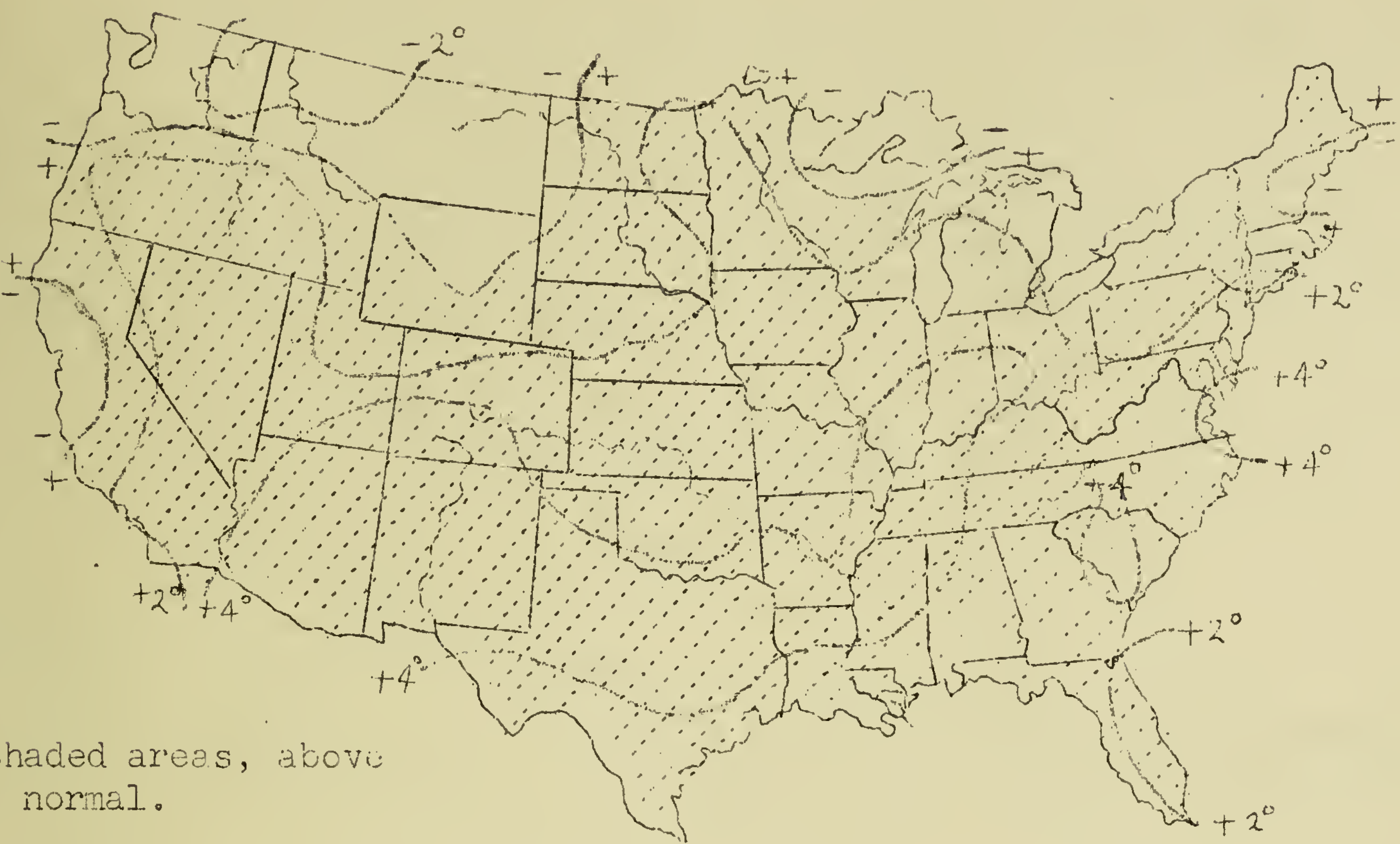
WEATHER OF NOVEMBER AND OF THE FALL OF 1942

(From U. S. Department of Commerce, Weekly Weather and Crop Bulletin for week ending December 8, 1942).

The end of November terminated the fall season for the current year. In general, the season was characterized by favorable weather, except for too much rain in some interior, eastern, and far northwestern sections, and rather serious dryness in much of the South, especially the Southeast and far Southwest. Temperatures were decidedly uniform, with averages for each of the last 2 months of the season slightly above normal in practically all sections of the country. September was relatively warm in the more eastern and far Western States, and moderately cooler than normal in intervening areas.

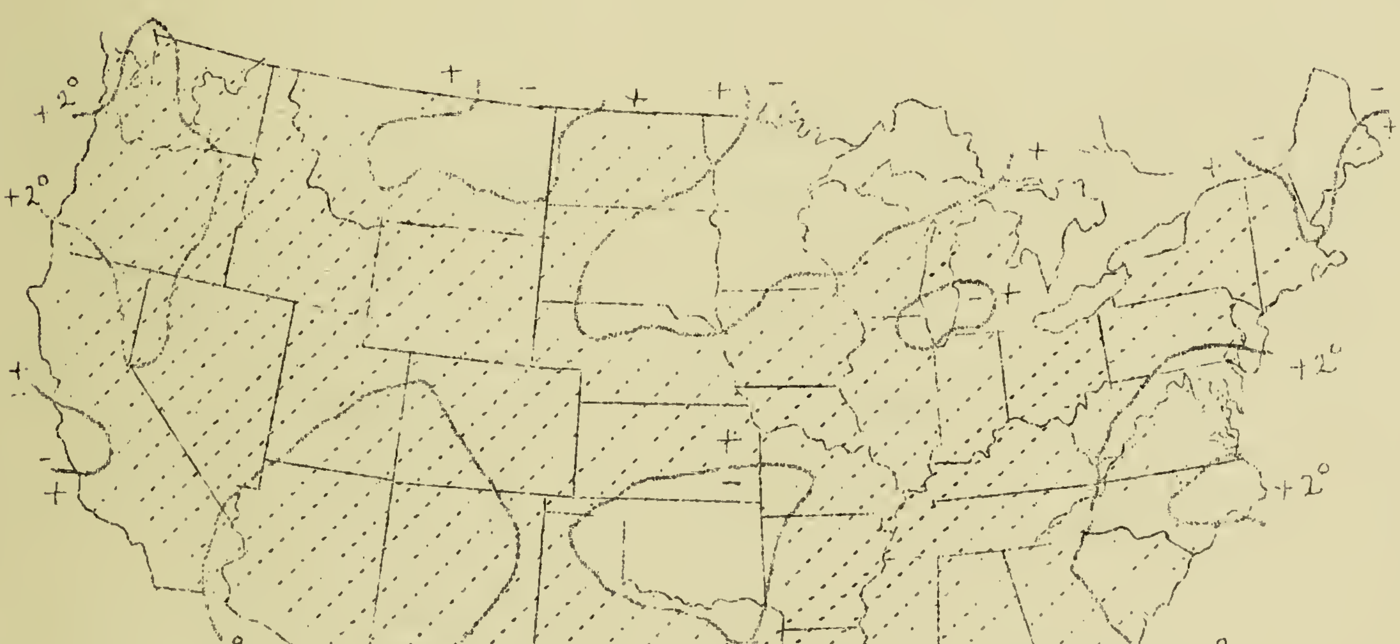
Figure 1 shows that November had slightly below normal temperature in a relatively small northwestern area and also very locally in the Northeast and on the Pacific coast; elsewhere there was somewhat more-than-normal warmth. Figure 2 shows the departures from normal for the fall season (September-November) as a whole. Except in a few limited areas, the averages were somewhat above normal. In fact, recent years have had a remarkable run of near-normal to above-normal fall temperatures. During the last decade not a single fall could be classed as generally cold, for all but one have averaged from practically normal temperature to decidedly above normal rather generally throughout the country; the one exception, that of 1937, had substantially below normal in Eastern States, though abnormally warm in the West.

Figure 3 shows the percentage of normal precipitation, by State averages, for November 1942. November was abnormally wet in a large northwestern area, including northern California, and also from the central Mississippi Valley and Lake Region eastward. This month was abnormally dry in the South, especially the Southwest where very little precipitation occurred; New Mexico had only 3 percent of normal rainfall for the month.



Shaded areas, above normal.

Fig. 1. Departure of Mean Temperature from Normal
November, 1942



Shaded areas, above normal.

Fig. 2. Departure of Mean Temperature from Normal
Sept. - Nov., 1942

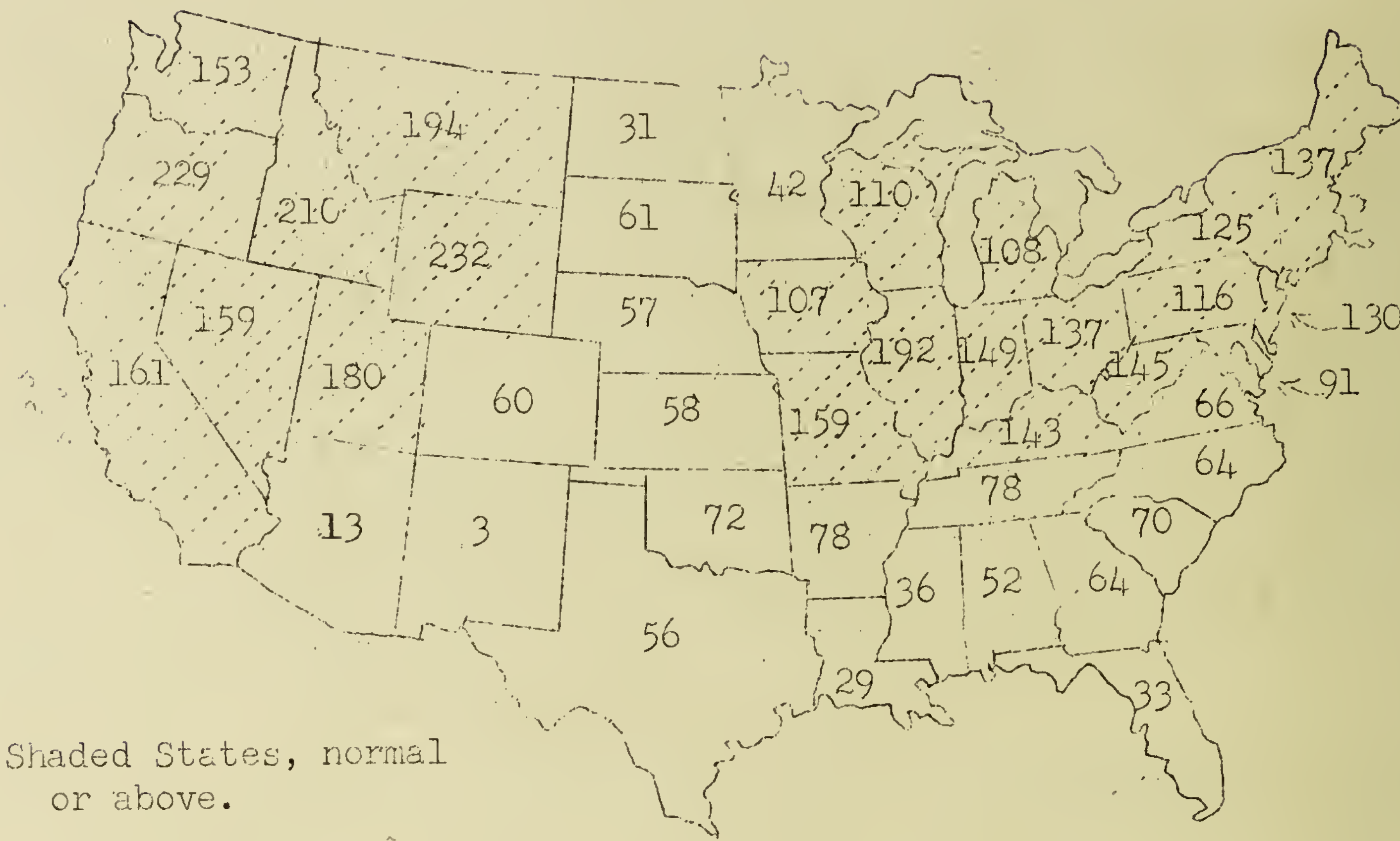


Fig. 3. Percentage of Normal Precipitation by States.
November, 1942

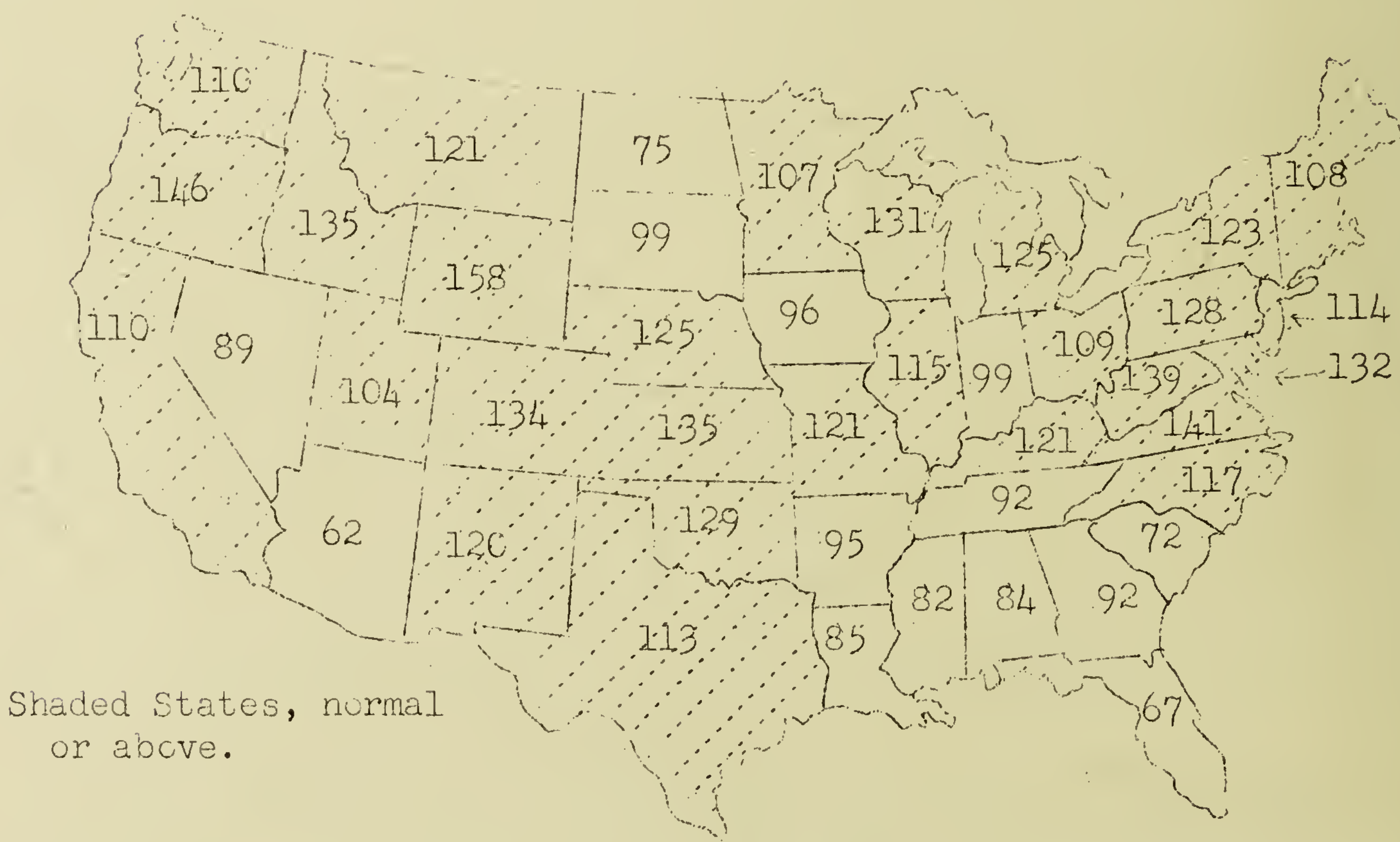


Fig. 4. Percentage of Normal Precipitation by States
The Fall (Sept. - Nov.) 1942

For the country as a whole fall is normally the driest season of the year, the United States average precipitation being 6.44 inches. The country-wide average for the fall of 1942 was 7.08 inches or 110 percent of normal.

For the fall season as a whole, Figure 4 shows deficient rainfall in the Southeast, parts of the Southwest, and a limited central-northern area. All other sections of the country had above normal, the excesses being largely in the middle East, Lake region, the far Northwest, Rocky Mountain States, and the southern Plains.

CHECK LIST REVISION

Freeman Weiss

VIBURNUM (CAPRIFOLIACEAE)

VIBURNUM spp. Native shrubs of many kinds and wide distribution in temperate N. America, chiefly of interest as furnishing food for wildlife, some also planted for ornament. Familiar examples: V. ACERIFOLIUM L., MAPLELEAF VIBURNUM, of Growth Regions 23 to 29 incl.; V. ALNIFOLIUM Marsh., HOBBLEBUSH, of G. R.'s 23, 24, 26, 27; V. DENTATUM L., ARROWWOOD, of G. R.'s 22 to 27; V. LANTANA L., WAYFARING TREE, native of Europe but naturalized in Eastern States; V. LENTAGO L., NANNYBERRY, of G. R.'s 13, 15, 18, 21 to 29 incl.; V. TRILOBUM Marsh., CRANBERRY-BUSH, of G. R.'s 4, 12, 15, 18, 21 to 27.

Botryosphaeria ribis (Tode ex Fr.) Gross. & Dug., on branches. Va.
Cercospora varia Pk., leaf spot. Me. to Gulf States, Colo. & Wis. (C. opuli (Fckl.) Höhn., reported in Ala., Miss. & Iowa, may be the same).
Coleosporium viburni Arth., rust (II, III). Ill., Iowa, Mich., Wis. O and I unknown.
Corticium stevensii Burt, thread blight. Fla., N. Car.
Cryptosphaeria secreta (Cke. & Ell.) Sacc., on twigs. N. J.
Cryptosporella lentaginis (Ell. & Ev.) Rehm, on twigs. Iowa.
Diaporthe beckhausii Nits., on branches. Mass., N. Y.
D. opuli Wehmeyer. N. Y., N. Dak.
D. viburni Dearn. & Bisby. Iowa, N. J.
Diplodia microspora Berk. & Curt., on twigs. Pa.
Dothiorella peckiana Sacc., on branches. N. Y.
Fomes conchatus (Pers. ex Fr.) Gill., on dead branches. Mo.
Godronia urceolus (Alb. & Schw. ex Fr.) Sacc., on dead branches. Mich.
Haplosporella viburni (Ell. & Dearn.) Petr. (?Physalospora obtusa), on twigs. N. Y.
Hendersonia foliorum Fckl. var. viburni Sacc., leaf spot. Fla., Texas.
Hymenochaete agglutinans Ell., stem-girdle. Pa.

VIBURNUM spp. cont.

Macrophoma hyalina (Berk. & Curt.) Berl. & Vogl., on branches. N. Y. (? Diplodia lantanae Fckl.)
M. viburni Dearn. & House, on branches. Md., N. Y. (Dothiorella viburni (Dearn. & House) Petr.)
Micropeltis viburni Dearn. & House, ? leaf blight. N. Y.
Microsphaera alni DC. ex Wint., powdery mildew. Widespread.
Pezicula minuta Pk., on dead branches. N. Y., Va.
Phyllosticta lantanoidis Pk., leaf spot. N. Y.
P. tinea Sacc. Me., Vt.
P. tineola Sacc. Wis.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physalospora obtusa (Schw.) Cke., on dead branches. N. Y.
Plasmopara viburni Pk., downy mildew. N. Y. to Ala. and Minn.
Pseudomonas viburni (Thornberry & Anderson) Stapp, leaf spot. Ill.
Puccinia linkii Klotzsch, rust (III). Ida., Mich., Mont., N. H., Wash.
Ramularia viburni Ell. & Ev., leaf spot. Tenn., Wis.
Sphaerographium hystricinum (Ell.) Sacc., and S. lantanoidis Pk., on dead branches. N. Y. The latter is Rhabdospora lantanoidis (Pk.) Jacz.
Verticillium albo-atrum Reinke & Berth., wilt. Ill.

VIBURNUM spp. Exotic flowering shrubs, grown for ornament, especially V. OPULUS L., SNOWBALL, of Europe, cult. Zone III; V. TOMENTOSUM Thunb., JAPANESE S., of E. Asia, cult. Zone IV; V. MACROCEPHALUM Fort., CHINESE S., of China, cult. Zone VI.

Agrobacterium tumefaciens (EFS. & Towns.) Conn, crown gall. Wash.
Botrytis cinerea Pers., shoot blight. Wash.
Cercospora tinea Sacc., leaf spot. La.
C. varia Pk. (? C. opuli (Fckl.) Höhn.). Iowa.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. Fla.
Corticium stevensii Burt, thread blight. N. Car.
Diaporthe opuli Wehmeyer, on branches. N. Dak.
Helminthosporium beaumontii Sacc., leaf spot. Ala., Texas.
Microsphaera alni DC. ex Wint., powdery mildew. Wis.
Phomopsis sp. (? P. beckhausii (Cke.) Trav.), on twigs, ? dieback. Md., N. Y.
Phyllosticta punctata Ell. & Dearn., leaf spot. Iowa, Wis.
Plasmopara viburni Pk., downy mildew. Md.
Pseudomonas viburni (Thornberry & Anderson) Stapp, leaf spot. Ill., Iowa.
Rhabdospora interrupta (Berk. & Curt.) Sacc., on stems. Alaska, Pa.

VIBURNUM TINUS L., LAURESTINUS. Large shrub or small tree of Mediterranean region, grown for ornament, Zone VI.

Cephaleuros virescens Kze., green scurf. Fla., La.
Hendersonia tini Ell. & Langl., leaf spot. La.

VIBURNUM TINUS cont.

Heterodera marioni (Cornu) Goodey, root knot. Calif. Also on V. davidi Franch., Md.
Leptosphaeria tini Ell. & Ev., leaf spot. La.
Plasmopara viburni Pk., downy mildew. Ga.
Verticillium albo-atrum Reinke & Berth., wilt. Oregon.

VITEX (VERBENACEAE)

VITEX AGNUS-CASTUS L., CHASTE-TREE. Shrub of S. Europe, grown for ornament, Zone VI-VII.

Cercospora viticis Ell. & Ev., leaf spot. La., Texas.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.

VITIS (VITACEAE)

VITIS spp., cultivated grapes. (1) Derived from V. VINIFERA L., EUROPEAN WINE GRAPE; commercial cultivation in U. S. restricted almost entirely to California.

Agrobacterium tumefaciens (EFS. & Towns.) Conn, crown gall. Ariz., Calif., Oregon, Wash.
Alternaria sp., fruit rot. Calif.
Armillaria mellea Vahl ex Fr., root rot. Calif., Wash.
Aspergillus niger Tiegh., bunch mold, black mold rot. Calif.
Botrytis cinerea Pers., gray mold rot, shoot blight. Calif., Oregon.
Cercospora vitis (Lév.) Sacc. (C. viticola (Ces.) Sacc.). See Mycosphaerella personata.
Cladosporium sp., green mold rot. Calif.
Cryptosporella viticola Shear, dead-arm, branch necrosis. ?Calif.
Didymosphaeria sarmenti (Cke. & Hark.) Berl. & Vogl., on twigs. Calif.
Diplodia viticola Desm., on canes. N. J.
Elsinoë ampelina (DBy.) Shear (Sphaceloma ampelinum DBy.), anthracnose. Texas.
Eutypella vitis (Schw. ex Fr.) Ell. & Ev., on branches. N. Car., Pa.
(Gloeosporium ampelophagum (Pass.) Sacc.): Elsinoë ampelina.
Glomerella cingulata (Ston.) Spauld. & Schrenk, ripe rot. Texas.
Guignardia bidwellii (Ell.) Viala & Ravaz, black rot. Ala., Mass., Nebr. (One of the principal factors in the failure of European grape culture in the Eastern States).

Heterodera marioni (Cornu) Goodey, root knot. Ala., Calif.
Isariopsis clavispora (Berk. & Curt.) Sacc. See Mycosphaerella personata.
Melanconium fuligineum (Scribner & Viala) Cav., bitter rot. Ga.
Micropera ampelina Sacc. & Fairm., on branches. N. Y.
Mycosphaerella personata Higgins (Cercospora vitis (Lév.) Sacc.), leaf spot. Fla., Ga., La. The conidial stage is also known as Isariopsis clavispora (Berk. & Curt.) Sacc.

VITIS spp. cont.
Nectria viticola Berk. & Curt., on branches. Ala.
Penicillium spp., blue mold rot. Cosmopolitan.
Pestalotia pezizoides de Not., on stems. S. Car.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Physopella vitis (Thüm.) Arth., rust (II). Fla., S. Car., P. R.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. Calif., Mich., N. Y. (One of the principal factors in the failure of European grape culture in the Eastern States).
Pratylenchus musicola (Cobb) Filip., in roots. Calif.
Sclerotinia sclerotiorum (Lib.) DBy., shoot blight. Calif.
Uncinula necator (Schw.) Burr., powdery mildew. Calif., Md., Idaho, Oregon, Wash.
Black measles ("black mildew") of fruit, - attributed to secondary effects of wood-rotting fungi in the trunk. Calif.
Pierce's disease (Anaheim, California vine, or Emperor disease), - unidentified virus. Calif.
Ring mildew, (fruit blemish), - cause unknown. Calif.
Shot berry, - defective pollination. Calif.
Sulphur dioxide injury (skin blanching, sunken caps), - SO_2 fumigation. Calif.
Water berry, - physiological, possibly excessive bearing. Calif.

VITIS spp., cultivated grapes. (2) Derived chiefly from V. LABRUSCA L., FOXGRAPE, of Growth Regions 22, 23, 24, 25, 26, 27; cult. Zone V; together with other native spp. in some localities.

Agrobacterium tumefaciens (EFS. & Town.) Conn, crown gall. Widespread.
Armillaria mellea Vahl ex Fr., root rot. Ark., Mo., Texas.
Botrytis cinerea Pers., gray mold rot. Cosmopolitan.
Briosia ampelophaga Cav., leaf blotch. Texas.
(Cercospora vitis (Lév.) Sacc.): Mycosphaerella personata.
Clitocybe tabescens (Scop. ex Fr.) Bres., root rot. S. Car. to Texas & Okla.
Coniothyrium diplodiella (Speg.) Sacc., white rot, dieback. Mass. to Fla. & Texas. (Also known as Coniella diplodiella (Speg.) Petr. & Syd.; Metasphaeria diplodiella Berl., said to be its perfect stage, is not reported in this range).
Cryptosporella viticola Shear, dead arm, branch necrosis. Widespread, chiefly in the N.E. States.
Cytospora vitis Mont., on twigs. Kans., Va. See Valsa vitis.
Daldinia concentrica (Bolt. ex Fr.) Ces. & de Not. and D. vernicosa (Schw.) Ces. & de Not., on stumps. Md., Va.
Diaporthe medusaea Nits., on stems. Va.
Diplodia viticola Desm., on twigs. Md., Mich., N. J., Va.
Elsinoë ampelina (DBy.) Shear (Sphaceloma ampelinum DBy.) anthracnose, bird's-eye rot. Widespread.
Endothia gyrosa Schw. ex Fr., on canes. N. Car.
Eutypella vitis (Schw. ex Fr.) Ell. & Ev. (Eutypa viticola Sacc.), on stems. Md., Mich.

VITIS spp. cont.

(Gloeosporium ampelophagum (Pass.) Sacc.): Elsinoë ampelina.
Glomerella cingulata (Ston.) Spauld. & Schrenk, ripe rot. Widespread.
Guignardia bidwellii (Ell.) Viala & Ravaz, black rot of fruit, leaf spot. General.
Haplosporella fabaeformis (Pass. & Thüm.) Petr. & Syd. (Sphaeropsis vitigena Ell. & Ev.), on stems. Kans., Md., N. Y.
Hendersonia sarmentorum Westend., on twigs. N. J., Texas.
Heterodera marioni (Cornu) Goodey, root knot. N. Car.
Hysterographium viticola (Cke. & Pk.) Rehm, on stems. Md., N. J., Va.
(Isariopsis clavispora (Berk. & Curt.) Sacc.): Mycosphaerella personata.
Leptothyrium pomi (Mont. & Fr.) Sacc. (? Microthyriella rubi Petr.), fly speck. Pa., W. Va.
Macrophoma farlowiana (Viala & Sauv.) F. Tassi, on leaves. N. Y.
M. peckiana (Thüm.) Berl. & Vogl., on twigs. N. Y.
M. reniformis (Viala & Ravaz) Cav., on stems. Va.
Melanconium fuligineum (Scribner & Viala) Cav., bitter rot. Widespread.
Mycosphaerella personata Higgins (Cercospora vitis (Lév.) Sacc., Isariopsis clavispora (Berk. & Curt.) Sacc.), leaf spot. Widespread.
Nectria coccinea Pers. ex Fr., on canes following crown gall. Oregon.
Nummularia clypeus (Schw.) Cke., on stems. Ala.
Penicillium spp., blue mold. Cosmopolitan.
Pestalotia spp., fruit rot, leaf and stem spot (secondary). (P. pezizoides de Not., Md., N. J., Va.; P. menezesiana Bres. & Torr., Conn., Fla.; ? P. uvicola Speg., widespread.)
Pezizella oenotherae (Cke. & Ell.) Sacc. Va.
Phoma spp. Of numerous forms reported under this name in association with fruit rot, leaf spot and dieback, P. uvicola Berk. & Curt. (= Guignardia bidwellii) is most frequent; for others see Macrophoma, Haplosporella and Phomopsis.
Phomopsis sp., on stems. Va. See Diaporthe.
Phyllosticta viticola (Berk. & Curt.) Thüm. (P. labruscae Thüm.). Conidial stage of Guignardia bidwellii.
Phymatotrichum omnivorum (Shear) Dug., root rot. Ariz., Nev., Texas.
Physalospora obtusa (Schw.) Cke., on canes. Mass. to Ga. & Mich.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. General.
Polyporus spp., wood rot, chiefly of old trunks and stumps, especially P. gilvus Schw. ex Fr., Tenn.; P. hirsutus Wulf. ex Fr., Va.; P. tulipiferus (Schw.) Overh., Va.; P. versicolor L. ex Fr., Ala., Mich., Va., Wis.
Poria spp., wood rot. P. isabellina (Fr.) Overh., Md.; P. papyracea (Schw.) Cke., N. Car., Va.; P. versipora Pers. ex Romell, Mich., Va.; P. viticola (Schw.) Cke., Md., Va.
Pratylenchus pratensis (De Man) Filip., on roots. Calif.
Pyrenochaeta vitis Viala & Sauv. (? Rhytisma vitis Schw.), on leaves. Mass., N. Y., Pa., Texas.

VITIS spp. cont.
Roesleria hypogaea Thüm. & Pass., root rot. N. Y. to Va., Mo., and Iowa.
Rosellinia necatrix (Hartig) Berl., white root rot. Ala., Ind., Mich., N. Y., Ohio.
Schizophyllum commune Fr., wood rot. Va.
Sclerotium bataticola Taub., root rot. Texas.
Septoria ampelina Berk. & Curt., leaf spot. N. Y., Texas, Va.
(Sphaceloma ampelinum DBy.): Elsinoë ampelina.
Sphaeropsis spp., on twigs and canes. See Haplosporella, Macrophoma and Physalospora.
Stereum spp., wood rot. S. purpureum Pers., Fla.; S. umbrinum Berk. & Curt., Va.
Uncinula necator (Schw.) Burr., powdery mildew. General.
Valsa vitis (Schw.) Berk. & Curt., (?Cytospora vitis Mont.), on twigs. Pa.

VITIS AESTIVALIS Michx., SUMMER GRAPE. Growth Regions 22, 23, 24, 25, 27, 28, 29; cult. Zone V.

Alternaria sp., ? leaf spot. Fla.
Diplodia viticola Desm., on stems. Pa.
Elsinoë ampelina (DBy.) Shear, anthracnose. Fla.
Eutypella vitis (Schw. ex Fr.) Ell. & Ev., on stems. Pa., S. Car.
Guignardia bidwellii (Ell.) Viala & Ravaz, black rot. Widespread.
Helminthosporium sp., ? leaf spot. Fla.
Heterodera marioni (Cornu) Goodey, root knot. Calif., Fla.
Macrophoma longispora (Thüm.) Berl. & Vogl., on stems. S. Car.
M. viticola (Cke.) Berl. & Vogl., on leaves. S. Car.
Phoma ampelina (Cke.) Sacc., on stems. Pa.
Phomopsis viticola Sacc., on stems. N. Y.
Phyllachora picea (Berk. & Curt.) Sacc., on stems. N. Y.
Physopella vitis (Thüm.) Arth., rust (II). Fla.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. Widespread.
Pyrenochaeta vitis Viala & Sauv., on leaves. Miss., S. Car.
Rhabdospora mueggenburgii Sacc., on stems. La.
Septoria ampelina Berk. & Curt., leaf spot. N. Y., Va.
Uncinula necator (Schw.) Burr., powdery mildew. Widespread.

VITIS BAILEYANA Muns., POSSUM GRAPE. Growth Regions 25, 27, 28, 29. Also V. BERLANDIERI Planch., WINTER GRAPE, of G. R.'s 11, 17, 20, 30.

Coniothyrium berlandieri Viala & Sauv., leaf spot. Texas.
Corticium sp., root rot. Texas.
Heterodera marioni (Cornu) Goodey, root knot. Texas.
Pyrenochaeta vitis Viala & Sauv., on leaves. Texas.

VITIS CALIFORNICA Benth., CALIFORNIA GRAPE. Growth Regions 1, 2, 3, 4, 10, 11. Also V. ARIZONICA Engelm., CANYON GRAPE, of G. R.'s 9, 10, 11, 16, 17.

VITIS CALIFORNICA cont.

Dichomera viticola Cke. & Hark., on dead stems. Calif.
Fusicladium minutulum Sacc., on leaves. Oregon, Wash.
Heterodera marioni (Cornu) Goodey, root knot. Calif.
Mycosphaerella personata Higgins (Cercospora vitis (Lév.) Sacc.), leaf spot. Calif.
Phoma vitis Bon., on stems. Calif.
Phyllosticta spermoides Pk., leaf spot. Calif.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. Calif.
Septosporium heterosporum Ell. & Gall. (? Cercospora roesleri (Catt.) Sacc.), leaf spot. Calif.
Uncinula necator Schw. ex Burr., powdery mildew. Calif.

VITIS ROTUNDIFOLIA Michx., MUSCADINE GRAPE. Growth Regions 20, 22, 25, 28, 29, 30; cult. Zone V. Also V. MUNSONIANA Simpson, BIRD GRAPE, of G. R.'s 30 & 31.

Armillaria mellea Vahl ex Fr., root rot. Fla., Miss., N. Car.
Botryosphaeria ribis (Tode ex Fr.) Gross & Dug., on canes. Fla.
(Cercospora brachypus Ell. & Ev.): Mycosphaerella angulata.
Cryptosporella viticola Shear, canker, dead-arm. Miss., N. & S. Car.
Cryptostictis inaequalis Tehon & Stout, on leaves. Ill.
Eutypella vitis (Schw. ex Fr.) Ell. & Ev. (? E. fraxinicola (Cke. & Pk.) Sacc.), on stems. Ala., Ga., N. Car.
Guignardia sp., muscadine black rot. Ga.
G. bidwellii (Ell.) Viala & Ravaz, black rot. Del. to Gulf States, Mo. & Iowa. (Chiefly a foliage disease on this host; reported under this name but may be a distinct sp. as found in Ga.)
Macrophoma sp., soft rot. Ga.
Melanconium sp. (? M. fuligineum (Scribner & Viala) Cav.), bitter rot. Fla., Ga.
Mycosphaerella angulata Jenkins (Cercospora brachypus Ell. & Ev.), angular leaf spot. Ala., Ga., Va.
Physalospora fusca N. E. Stevens, on stems. S. Car.
P. obtusa (Schw.) Cke. Ala., Ga.
P. rhodina (Berk. & Curt.) Cke. S. Car.
Physopella vitis (Thüm.) Arth., rust (II). Ala., Fla.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. (Resistant). Ala., Mich.
Septoria ampelina Berk. & Curt., leaf spot. N. Car., Texas.
Tryblidiella rufula (Spreng. ex Fr.) Sacc., on stems. Fla.

VITIS RUPESTRIS Scheele, SAND GRAPE. Indigenous to Growth Regions 11, 16, 17, 20, 25, 27, 28, 29; cult. Zone V; also V. CINEREA Engelm., SWEET WINTER G., of G. R.'s 11, 17, 20, 22, 23, 25, 29, 30.

Guignardia bidwellii (Ell.) Viala & Ravaz, black rot. Texas, W. Va.
Heterodera marioni (Cornu) Goodey, root knot. Miss.
Mycosphaerella personata Higgins, leaf spot. Kans.

VITIS RUPESTRIS cont.
Phymatotrichum omnivorum (Shear) Dug., root rot. Texas.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. Ill., Ind., La.
Uncinula necator Schw. ex Burr., powdery mildew. Ill.

VITIS VULPINA L., FROST GRAPE. Indigenous throughout the Eastern States and Mississippi Valley, and along streams to the Rocky Mts. Some authorities distinguish V. cordifolia Lam. and V. riparia Michx. Used chiefly for rootstocks but has also furnished hort. vars. of table grapes.

Ascochyta ampelina Sacc., on leaves. Wis.
Cercospora vulpina Ell. & Kell., leaf spot. Kans.
Eutypella vitis (Schw. ex Fr.) Ell. & Ev., on stems. N. J.
Gloeodes pomigena (Schw.) Colby, on stems. Ind.
Guignardia bidwellii (Ell.) Viala & Ravaz, black rot. General.
Haplosporella fabaeformis (Pass. & Thüm.) Petr. & Syd., on stems. Kans., Md., N. J., N. Y.
Helminthosporium siliquosum Berk. & Curt., on twigs. S. Car.
Heterodera marioni (Cornu) Goodey, root knot. Calif., Miss.
Hysterographium flexuosum (Schw. ex Fr.) Rehm and H. vulvatum (Schw.) Rehm, on stems. N. Car.
Macrophoma farlowiana (Viala & Sauv.) F. Tassi, on leaves. N. Y.
Mycosphaerella personata Higgins (Cercospora vitis (Lév.) Sacc.), leaf spot. Ga., Ill., La., Mich., Mo.
Myxosporium viticola Dearn. & House, on stems. N. Y.
Pestalotia pezizoides de Not., on stems. Md., Kans., S. Car.
*Phyllosticta spermoides Pk., leaf spot. Ill., Kans., N. Y., Wis. (P. viticola (Berk. & Curt.) Thüm.): Guignardia bidwellii.
Physalospora spp., on canes & branches. P. fusca N. E. Stevens, S. Car.; P. obtusa (Schw.) Cke., Va.
Plasmopara viticola (Berk. & Curt.) Berl. & de Toni, downy mildew. Widespread.
Polyporus versicolor L. ex Fr., wood rot. Nebr.
Pyrenochaeta vitis Viala & Sauv. (? Rhytisma vitis Schw.), on leaves. N. Car., Pa., Texas.
Rhabdospora mueggenburgii Sacc., on stems. La.
Septoria ampelina Berk. & Curt., leaf spot. S. Car., Texas. S. kellermaniana Thüm. Kans.
Thyridium vitis Ell. & Ev., on stems. Kans.
Uncinula necator (Schw.) Burr., powdery mildew. Widespread.
Valsa vitis Schw. ex Berk. & Curt., on stems. Pa.

(DIVISION OF MYCOLOGY AND DISEASE SURVEY).

*Insert. Pezizella oenotherae (Cke. & Ell.) Sacc. (Sclerotiopsis concava (Desm.) Shear & Dodge), on stems. Va.

THE PLANT DISEASE REPORTER

Issued by

THE PLANT DISEASE SURVEY, DIVISION OF MYCOLOGY AND DISEASE SURVEY
BUREAU OF PLANT INDUSTRY, SOILS, AND AGRICULTURAL ENGINEERING
AGRICULTURAL RESEARCH ADMINISTRATION
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INDEX TO VOLUME XXVI

Volume XXVI, 1942 (Issued May 1, 1943) Number 24

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

AUTHOR INDEX

The Survey wishes to thank all these contributors to Volume 26 of the Reporter.

SUBJECT INDEX

ERRATA

See also corrections on pages 82, 94, 173, 253, 373, 385, 439.
p. 328: Crown rust, read Puccinia coronata instead of P. anomala.
p. 370: 2d paragraph, read Gnomonia ulmea for elm leaf spot instead of G. veneta.
p. 382: frog-eye leafspot of soybean, correct spelling of species is daizu, not diazu as given.